BELKIN®

High-Speed Mode Wireless G Router with Built-In USB Print Server

User Manual

125 HIGH SPEED MODE

802.11g • 125 High-Speed Mode • 2.4GHz • Wireless

35% FASTER

F5D7231-4P

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Introduction

Thank you for purchasing the Belkin High-Speed Mode Wireless G Router (the Router) with Built-In USB Print Server. Below are two short sections, one discusses the benefits of home networking, the other outlines best practices in order to maximize your wireless home network range and performance. Please be sure to read through this User Manual completely, and pay special attention to the section entitled "Placement of your Wireless Networking Hardware for Optimal Performance" on the next page. By following our simple setup instructions your Belkin Home Network will allow you to:

- Share one high-speed Internet connection with all the computers in your home
- Share a single printer with the entire family
- Share resources, such as files, and hard drives among all the connected computers in your home
- Share documents, music, video, and digital pictures
- Store, retrieve, and copy files from one computer to another
- Simultaneously play games online, check Internet e-mail, and chat

Here are some of the advantages of setting up a Belkin Wireless Network:

Mobility – you'll no longer need a dedicated "computer room"— now you can work on a networked laptop or desktop computer from virtually anywhere within your wireless range

Easy installation – Belkin's Easy Installation Wizard makes setup simple

Flexibility – set up and access printers, computers, and other networking devices from anywhere in your home

Easy Expansion – the wide range of Belkin networking products let you expand your network to include devices such as printers and gaming consoles

No cabling required – you can spare the expense and hassle of retrofitting Ethernet cabling throughout the home or office

Widespread industry acceptance – choose from a wide range of interoperable networking products

Placement of your Wireless G Router

Important Factors for Placement and Setup

Your wireless connection will be stronger the closer your computer is to your Wireless Router or Access Point. Typical indoor operating range for your wireless devices is between 100 and 200 feet. In the same way, your wireless connection and performance will degrade somewhat as the distance between your Wireless Router or Access Point and connected devices increases. This may or may not be noticeable to you. As you move further from your Wireless Router or Access Point, connection speed may decrease. Factors that can weaken signals simply by getting in the way of your network's radio waves are metal appliances or obstructions, and walls.

If you have concerns about your network's performance that might be related to range or obstruction factors, try moving the computer to a position between five and ten feet from the Wireless Router or Access Point, in order to see if distance is the problem. If difficulties persist even at close range, please contact Belkin Technical Support.

Note: While some of the items listed below can affect network performance, they will not prohibit your wireless network from functioning; if you are concerned that your network is not operating at its maximum effectiveness, this checklist may help.

1. **Wireless Router or Access Point Placement**
   Place your Wireless Router or Access Point, the central connection point of your network, as close as possible to the center of your wireless network devices.

   To achieve the best wireless network coverage for your "wireless clients" (i.e., computers enabled by Belkin Wireless Notebook Network Cards, Wireless Desktop Network Cards, and Wireless USB Adapters):
   - Ensure that your Wireless Router's or Access Point's networking antennas are parallel to each other, and are positioned vertically (toward the ceiling). If your Wireless Router or Access Point itself is positioned vertically, point the antennas as much as possible in an upward direction.
   - In multistory homes, place the Wireless Router or Access Point on a floor that is as close to the center of the home as possible. This may mean placing the Wireless Router or Access Point on an upper floor.
   - Try not to place the Wireless Router or Access Point near a cordless 2.4GHz phone.

2. Avoid Obstacles and Interference

Avoid placing your Wireless Router or Access Point near devices that may emit radio "noise," such as microwave ovens. Dense objects that can inhibit Wireless communication include:

- Refrigerators
- Washers and/or dryers
- Metal cabinets
- Large aquariums
- Metallic-based UV tinted windows

If your wireless signal seems weak in some spots, make sure that objects such as these are not blocking the signal's path (between your computers and Wireless Router or Access Point).

3. Cordless Phones

If the performance of your wireless network is impaired after attending to the above issues, and you have a cordless phone:

- Try moving cordless phones away from Wireless Routers or Access Points and your wireless-enabled computers
- Unplug and remove the battery from any cordless phone that operate on the 2.4GHz band (check manufacturers information). If this fixes the problem, your phone may be interfering.
- If your phone supports channel selection, change the channel on the phone to the furthest channel from your wireless network. For example, change the phone to channel 1 and move your Wireless Router or Access Point to channel 11. See your phone's user manual for detailed instructions.
- If necessary, consider switching to a 900MHz or 5GHz cordless phone.

4. Choose the "quietest" channel for your wireless network

In locations where homes or offices are close together, such as apartment buildings or office complexes, there may be wireless networks nearby that can conflict with yours.

Use the Site Survey capabilities found in the Wireless LAN Utility of your wireless adapter to locate any other wireless networks that are available (see your wireless adapter's manual), and move your Wireless Router (or Access Point) and computers to a channel as far away from other networks as possible.

Experiment with more than one of the available channels, in order to find the clearest connection and avoid interference from neighboring cordless phones or other wireless devices.

For Belkin wireless networking products, use the detailed Site Survey and wireless channel information included in your User Guide.

These guidelines should allow you to cover the maximum possible area with your Wireless Router or Access Point. Should you need to cover an even wider area, we suggest the Belkin Wireless Range Extender/Access Point.

5. Secure connections, VPNs, and AOL

Secure connections are connections that typically require a user name and password, and are used where security is important. Secure connections include:

- Virtual Private Network (VPN) connections, often used to connect remotely to an office network
- The “Bring Your Own Access” program from America Online (AOL), which lets you use AOL through broadband provided by another cable or DSL service
- Most on-line banking websites
- Many commercial websites which require a username and password to access your account

Secure connections can be interrupted by a computer’s power management setting, which causes it to “go to sleep.” The simplest solution to avoid this is to simply reconnect by re-running the VPN or AOL software, or by re-logging into the secure web site.

A second alternative is to change your computer’s power management settings so it does not go to sleep; however, this may not be appropriate for portable computers. To change your power management setting under Windows, see the “Power Options” item in the Control Panel.

If you continue to have difficulty with Secure Connection, VPNs and AOL please review the steps above to be sure you have addressed these issues.

Introduction

For more information regarding our networking products, visit our website at **www.belkin.com/networking** or call Belkin Technical Support at:

US:	**877-736-5771**
	310-898-1100 ext.2263
Europe:	**00 800 223 55 460**
Australia:	**1800 666 040**

Product Overview

Product Features

In minutes you will be able to share your Internet connection and network your computers. The following is a list of features that make your new Belkin Wireless G Router an ideal solution for your home or small office network.

Works with Both PCs and Mac® Computers

The Router supports a variety of networking environments including Mac OS® 8.x, 9.x, X v10.x, AppleTalk®, Linux®, Windows® 95, 98, Me, NT®, 2000, and XP, and others. All that is needed is an Internet browser and a network adapter that supports TCP/IP (the standard language of the Internet).

Front-Panel LED Display

Lighted LEDs on the front of the Router indicate which functions are in operation. You'll know at-a-glance whether your Router is connected to the Internet. This feature eliminates the need for advanced software and status-monitoring procedures.

Built-in USB Print Server

Your router includes a built-in USB print server that lets you print to a USB printer from any computer on the network. The print server is very simple to setup and convenient to use. Simply install your printer's drivers and software on each computer, and then run the easy to use Print Server Setup Wizard to setup the print server. In minutes, all of your computers will have access to the same printer.

NAT IP Address Sharing

Your Router employs Network Address Translation (NAT) to share the single IP address assigned to you by your Internet Service Provider while saving the cost of adding additional IP addresses to your Internet service account.

SPI Firewall
Your Router is equipped with a firewall that will protect your network from a wide array of common hacker attacks including IP Spoofing, Land Attack, Ping of Death (PoD), Denial of Service (DoS), IP with zero length, Smurf Attack, TCP Null Scan, SYN flood, UDP flooding, Tear Drop Attack, ICMP defect, RIP defect, and fragment flooding.

Integrated 10/100 4-Port Switch
The Router has a built-in, 4-port network switch to allow your wired computers to share printers, data and MP3 files, digital photos, and much more. The switch features automatic detection so it will adjust to the speed of connected devices. The switch will transfer data between computers and the Internet simultaneously without interrupting or consuming resources.

Universal Plug-and-Play (UPnP) Compatibility
UPnP (Universal Plug-and-Play) is a technology that offers seamless operation of voice messaging, video messaging, games, and other applications that are UPnP-compliant.

Support for VPN Pass-Through
If you connect to your office network from home using a VPN connection, your Router will allow your VPN-equipped computer to pass through the Router and to your office network.

Built-In Dynamic Host Configuration Protocol (DHCP)
Built-In Dynamic Host Configuration Protocol (DHCP) on-board makes for the easiest possible connection of a network. The DHCP server will assign IP addresses to each computer automatically so there is no need for a complicated networking setup.

Easy Install Wizard
The Easy Install Wizard takes the guesswork out of setting up your Router. This automatic software determines your network settings for you and sets up the Router for connection to your Internet Service Provider (ISP). In a matter of minutes, your Wireless Router will be up and running on the Internet. A separate wizard is included for setup of the print server.

NOTE: Easy Install Wizard software is compatible with Windows 98SE, Me, 2000, XP and Mac OS 9.X and Mac OS X. The Print Server Setup Wizard software is compatible with Windows 98SE, Me, 2000, and XP. If you are using another operating system, the Wireless Router can be set up using the Alternative Method described in this manual (see page 34).

Integrated 802.11g Wireless Access Point

802.11g is an exciting new wireless technology that achieves data rates up to 54Mbps in 54G Mode, nearly five times faster than 802.11b.

125 High-Speed Mode

High-Speed Mode (HSM)*, a 54g™ performance enhancement, provides the fastest wireless connectivity for 802.11g-capable networks in real-world environments. It is designed for home networks that require additional bandwidth for applications such as sharing digital pictures. 125HSM makes 802.11g WLANs more efficient without impacting the performance of neighboring networks, and is compatible at high speeds with leading brands.

Integrated Parental Control Web Content Filter

Belkin has teamed with Cerberian, a leading content-filtering company, to bring you this unique feature. Your Belkin Wireless G Router is the first home networking solution with an integrated web content filter that allows you to block unwanted or offensive web content before it makes it to your network. Unlike other Parental Control solutions, Parental Control is built into the Belkin Wireless Router, so there is no software to install on any computer and you will never be charged a per-computer fee for the service, ever. Your Wireless Router comes with a six-month free trial of this feature so you can take advantage of the capabilities right away. No credit card is needed to use the trial. You have control: Belkin Parental Control can be modified to meet your needs. You can set up your own policies and block any website you want. There is also an optional reporting feature (fee-based) that allows you to get a report showing you every website that was visited from your network (refer to your Parental Control Manual for more information).

MAC Address Filtering

For added security, you can set up a list of MAC addresses (unique client identifiers) that are allowed access to your network. Every computer has its own MAC address. Simply enter these MAC addresses into a list using the web-based user interface and you can control access to your network.

*When operating in High-Speed Mode, this Wi-Fi device may achieve an actual throughput of up to or greater than 34.1Mbps, which is the equivalent throughput of a system following 802.11g protocol and operating at a signaling rate of 125Mbps. Actual throughput will vary depending on environmental, operational and other factors.

Knowing Your Router

Package Contents

- Belkin High-Speed Mode Wireless G Router with Built-In USB Print Serverr
- Quick Installation Guide
- Belkin Easy Install Wizard Software CD
- Belkin RJ45 Ethernet Networking Cable
- Power Supply
- User Manual

System Requirements

- Broadband Internet connection such as a cable or DSL modem with RJ45 (Ethernet) connection
- At least one computer with an installed network interface adapter
- TCP/IP networking protocol installed on each computer
- RJ45 Ethernet networking cable
- Internet browser

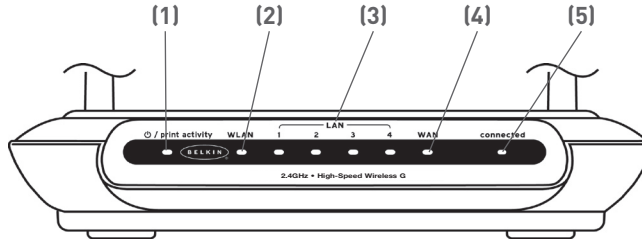
Easy Install Wizard Software System Requirements

- A PC running Windows 98SE, Me, 2000, or XP or a Mac computer running Mac OS 9.x or OS X
- Minimum 64MB RAM
- Internet Browser

Print Server Setup Wizard System Requirements

- A PC running Windows 98SE, Me, 2000, or XP
- Minimum 64MB RAM

The Router has been designed to be placed on a desktop. All of the cables exit from the rear of the Router for better organization and utility. The LED indicators are easily visible on the front of the Router to provide you with information about network activity and status.



1. Power/Ready/Print Activity LED

When you apply power to the Router or restart it, a short period of time elapses while the Router boots up. During this time, the LED blinks. When the Router has completely booted up, the Power/Ready LED becomes a SOLID light, indicating the Router is ready for use. When data is being sent to the printer, the light will blink fast.

OFF	Router is OFF
Slow Blinking Green	Router is Booting Up
Solid Green	Router is Ready
Fast Blinking Green	Printer Activity

2. WLAN: Wireless Network LED

OFF	Wireless Network is OFF
Green	Wireless Network is Ready
Blinking	Indicates Wireless Activity

3. LAN Port-Status LEDs

These LEDs are labeled 1–4 and correspond to the numbered ports on the rear of the Router. When a computer is properly connected to one of the LAN ports on the rear of the Router, the LED will light. GREEN means a 10Base-T device is connected, ORANGE means a 100Base-T device is connected. When information is being sent over the port, the LED blinks rapidly.

OFF	No Device is Linked to the Port
Green	10Base-T Device Connected
Orange	100Base-Tx Device Connected
Blinking (Orange or Green)	Port Activity

4. WAN Status LED

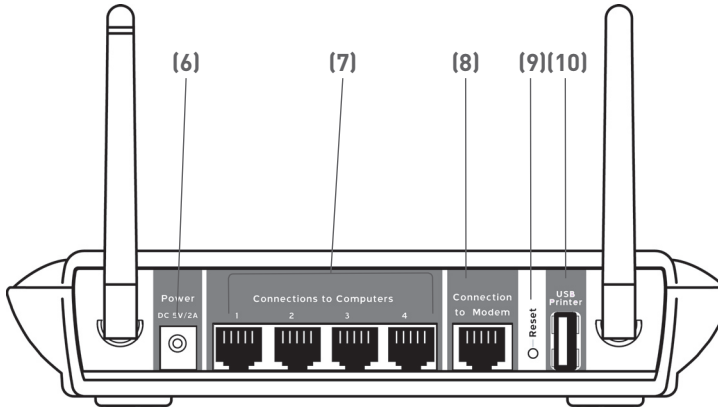
This LED lights in GREEN to indicate that your modem is connected properly to the Router. It blinks rapidly when information is being sent over the port between the Router and the modem.

OFF	No WAN Link
Solid Green	Good WAN Link
Blinking Green	WAN Activity

5. Connected LED

This unique LED shows you when the Router is connected to the Internet. When the light is OFF, the Router is NOT connected to the Internet. When the light is blinking, the Router is attempting to connect to the Internet. When the light is solid GREEN, the Router is connected to the Internet. When using the "Disconnect after x minutes" feature, this LED becomes extremely useful in monitoring the status of your Router's connection.

OFF	Router is not Connected to the Internet
Blinking Green	Router is Attempting to Connect to the Internet
Solid Green	Router is Connected to the Internet



6. **Power Jack - GRAY**
   Connect the included 5V DC power supply to this jack.

7. **Connections to Computers (LAN Ports) - BLUE**
   Connect your wired (non-wireless) computers to these ports. These ports are RJ45, 10/100 auto-negotiation, auto-uplinking ports for standard UTP category 5 or 6 Ethernet cable. The ports are labeled 1 through 4. These ports correspond to the numbered LEDs on the front of the Router.

8. **Connection to Modem (WAN Port) - GREEN**
   This port is for connection to your cable or DSL modem. Use the cable that was provided with the modem to connect the modem to this port. Use of a cable other than the cable supplied with the cable modem may not work properly.

9. **Reset Button**
   The Reset button is used in rare cases when the Router may function improperly. Resetting the Router will restore the Router's normal operation while maintaining the programmed settings. You can also restore the factory default settings by using the Reset button. Use the restore option in instances where you may have forgotten your custom password.

   a. **Resetting the Router**
      Push and release the Reset button. The lights on the Router will momentarily flash. The Power/Ready light will begin to blink. When the Power/Ready light becomes solid again, the reset is complete.

b. Restoring the Factory Defaults
Press and hold the Reset button for at least ten seconds then release it. The lights on the Router will momentarily flash. The Power/Ready light will begin to blink. When the Power/Ready light becomes solid again, the restore is complete.

10. USB Port - PURPLE
For USB printers only. See the section called “Connecting your printer to Router’s print server” on page 22.

Verify the contents of your box. You should have the following:

- Belkin High-Speed Mode Wireless G Router
- Quick Installation Guide
- Belkin Easy Install Wizard Software CD
- RJ45 Ethernet Networking Cable (for connection of the Router to the computer)
- Power Supply
- User Manual

Modem Requirements

Your cable or DSL modem must be equipped with an RJ45 Ethernet port. Many modems have both an RJ45 Ethernet port and a USB connection. If you have a modem with both Ethernet and USB, and are using the USB connection at this time, you will be instructed to use the RJ45 Ethernet port during the installation procedure. If your modem has only a USB port, you can request a different type of modem from your ISP, or you can, in some cases, purchase a modem that has an RJ45 Ethernet port on it.

Ethernet

USB

ALWAYS INSTALL YOUR ROUTER FIRST! IF YOU ARE INSTALLING NUMEROUS NETWORK DEVICES FOR THE FIRST TIME, IT IS IMPORTANT THAT YOUR ROUTER IS CONNECTED AND RUNNING BEFORE ATTEMPTING TO INSTALL OTHER NETWORK COMPONENTS SUCH AS NOTEBOOK CARDS AND DESKTOP CARDS.

Easy Install Wizard

Belkin has provided our Easy Install Wizard software to make installing your Router a simple and easy task. You can use it to get your Router up and running in minutes.

The Easy Install Wizard requires that your Windows® 98SE, Me, 2000, XP or Mac OS 9.2x, X.1.x computer be connected directly to your cable or DSL modem and that the Internet connection is active

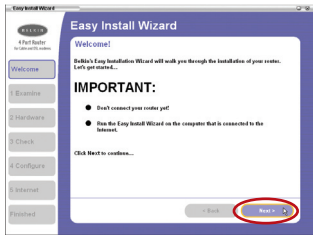
and working at the time of installation. If it is not, you must use the "Alternate Setup Method" section of this manual to configure your Router. Additionally, if you are using an operating system other than Windows 98SE, Me, 2000, or XP, you must set up the Router using the "Alternate Setup Method" section of this manual.

IMPORTANT: Run the Easy Install Wizard software from the computer that is directly connected to the cable or DSL modem. **DO NOT CONNECT THE ROUTER AT THIS TIME.**

Step 1 | Run the Easy Install Wizard Software

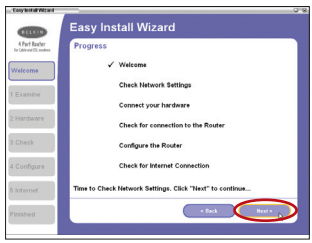
1. Shut down any programs that are running on your computer at this time.
2. Make sure you have the following items at the computer that is now directly connected to the cable or DSL modem. DO NOT CONNECT THE ROUTER AT THIS TIME.
   - Quick Installation Guide
   - The Easy Install Wizard CD-ROM
   - The Router
   - The Router power supply
   - RJ45 Ethernet networking cable
   - This User Manual
3. Turn off any firewall or Internet connection sharing software on your computer.
4. Insert the Easy Install Wizard software CD into your CD–ROM drive. The Installation Menu will automatically appear on your screen within 15 seconds. If it does not, select your CD-ROM drive from "My Computer" and double-click on the file named "Start.exe" on the CD-ROM.

5. Click “Run Router Setup Wizard”.



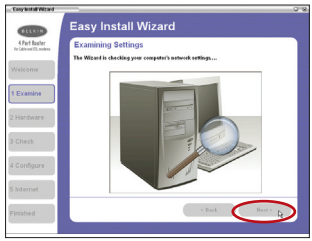
Welcome Screen

The Wizard’s welcome screen will appear. Make sure you have not connected the Router at this point. If you have connected your Router, please reconnect your computer directly to the modem. Click “Next” when you are ready to move on.



Progress Screen

Easy Install will show you a progress screen each time a step in the setup has been completed. Each time you see the progress screen, click “Next” when you are ready to move to the next step.



Examining Settings

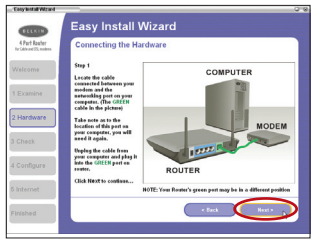
The Wizard will now examine your computer's network settings and gather information needed to complete the Router's connection to the Internet. When the Wizard is finished examining your computer, click "Next" to continue.

Multi-NICs Screen

If you have more than one network adapter installed in your computer a Multi-NIC Screen will appear. If you have more than one network adapter installed in your computer, the Wizard will need to know which adapter is connected to your modem. Select the network card that is connected to your modem from the list and click "Next". If you are not sure which adapter to choose, select the adapter at the top of the list. If you mistakenly choose the wrong adapter now, you will be able to choose a different one later.

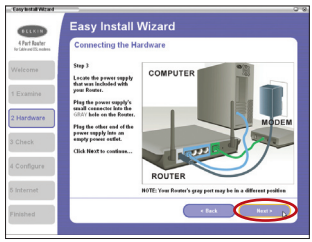
Step 2 | Hardware Setup

The Wizard will walk you through connecting your Router to your computer and modem. Follow the steps on the screen using the pictures as a guide.

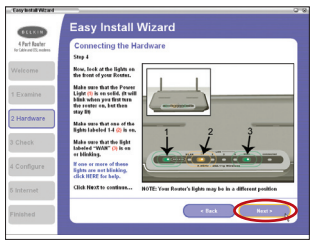


2.1 This step instructs you to locate the cable connected between your modem and the networking port on your computer. Unplug this cable from the computer and plug it into the GREEN port on the Router. Click "Next" to continue.

2.2 This step instructs you to locate the BLUE cable that is included with your Router. Plug one end of this cable into ANY one of the BLUE ports on your Router. Plug the other end of the cable into the networking port on your computer. Click “Next” to continue.

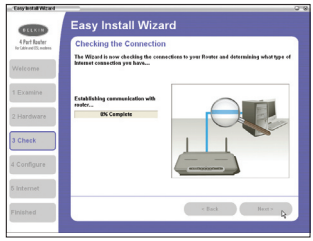


2.3 This step instructs you to locate the power supply that is included with your Router. Plug the power supply’s small connector into the GRAY port on the Router. Plug the power supply into an empty power outlet. Click “Next” to continue.

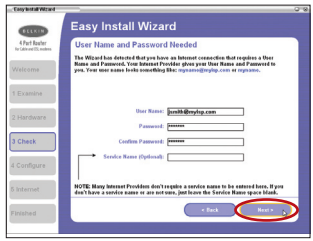


2.4 This step instructs you to look at the lights on the front of your Router. Make sure the appropriate lights are ON. Refer to the Easy Install software on your computer’s screen for more details. Click “Next” to continue.

Step 3 | Checking the Connection



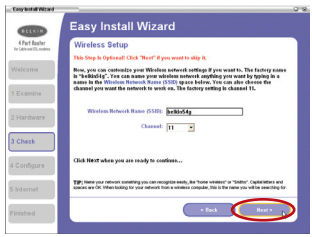
3.1 Once you have completed connecting the Router, the Wizard will check the connection to the Router and then go on to determine what type of Internet connection you have.



3.2 User Name and Password Needed

If you have a connection type that requires a user name and a password, the Wizard will ask you to type in your user name and password. If your connection type does not require a user name and password, you will not see this screen.

Your user name and password is provided to you by your Internet Service Provider. If you have to type in a user name and password to connect to the Internet, then type that same user name and password in here. Your user name looks something like “jsmith@myisp.com” or simply “jsmith”. The service name is optional and is very rarely required by your ISP. If you don’t know your service name, leave this blank. When you have entered your information, click “Next” to move on.



3.3 Wireless Setup

This Step Is Optional. Click “Next” if you want to skip it.

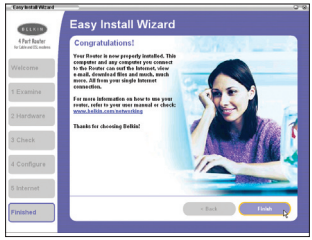
Using this step, you can customize your wireless network settings if you want to. Follow the steps on the screen to complete this step. Click “Next” to continue.

Step 4 Configuring the Router

The Wizard will now transfer all of the configuration information to the Router. This will take approximately one minute. During this time, do not turn off the Router or computer. The Router will restart itself at the end of this step.

4.1 Checking Internet

The Wizard will now check for an Internet connection. This can take a few minutes. The Wizard may not detect a connection right away. If not, it will retry a number of times. The “Connected” light on the front panel of the Router will flash during this time. Please be patient through this process.



4.2 Finished

When the Internet connection is complete, the Wizard will tell you that you are finished. The "Connected" LED on the front of the Router will be solid GREEN, indicating that the Router is now connected to the Internet.

Your Router is now connected to the Internet. Now you can begin surfing the Internet by opening your browser and going to your favorite web page.

Congratulations! You have finished installing your new Belkin Router. You are ready to set up the other computers in your home. You can also add computers to your Router any time you want.

Connecting your printer to the Router's print server

Please closely follow the directions to set up your printer.

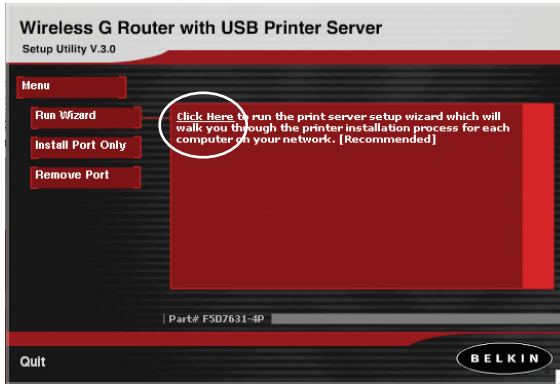
Before you start

Install the printer's drivers and software on each computer from which you plan to print. This enables the PC to print to the networked printer (printer that is attached to your USB Print Server). Every manufacturer ships its printer with a driver and, usually, printing software. In some cases, while installing the drivers and software for your printer, you may be required to connect the PC directly to the printer in order to complete the installation. This varies according to manufacturer. You must also install the Belkin Printer Port on each of the computers you want to print from. This may be done using the Printer Server Setup Wizard, or can be done manually.

Start

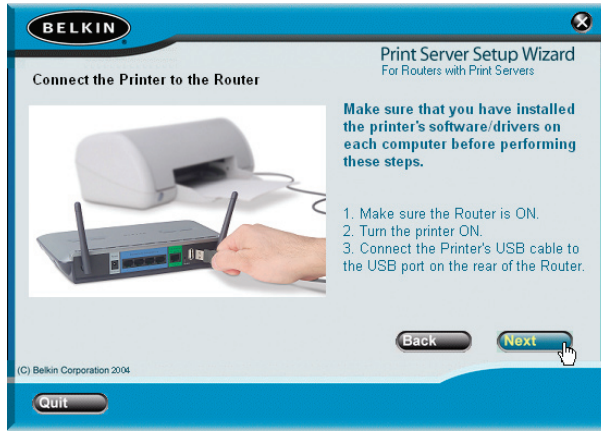
1. Insert the CD into your CD-ROM drive. Within 15 seconds, you should see the installation menu on the screen. If the menu does not appear within 15 seconds, select your CD-ROM drive and view the contents of the drive. Double-click on the file named "Start.exe".
2. From the menu, click on "Run Print Server Setup Wizard". This will open the Print Server Setup Wizard menu.

3. On the Wizard menu, drag your mouse over the “Run Wizard” button and click the words “Click Here” to start the Wizard.

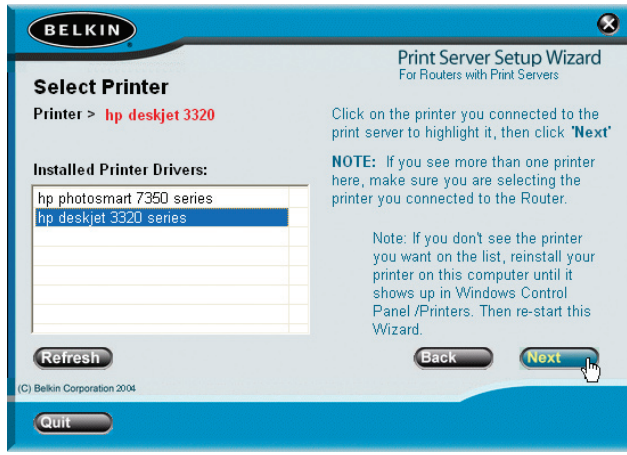


4. The first screen of the Wizard appears. Be sure that you have installed your printer’s drivers and software on the PCs from which you plan to print. Click “Next”.

5. Next, make sure the Router is ON. Make sure the printer is ON. Plug in the USB cable that is connected to the printer to the USB port on the rear of the Router. The USB port on the Router is color-coded purple. Click “Next”.

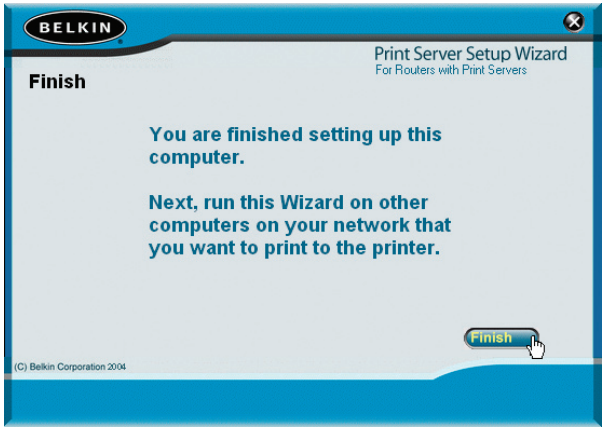


6. The Wizard will scan for and locate the Print Server in the Router. Next, a list of the printers installed on the computer will appear. Click once on the name of the printer that is connected to the Router to highlight it. Click “Next”.



7. The next screen that appears will allow you to test print. Click on the “Print Test Page” button. When your test page is finished printing, click “Next”.

8. You are now finished setting up your computer to print to the Print Server. Next, run this Wizard on the other computers on your network from which you wish to print to this printer.



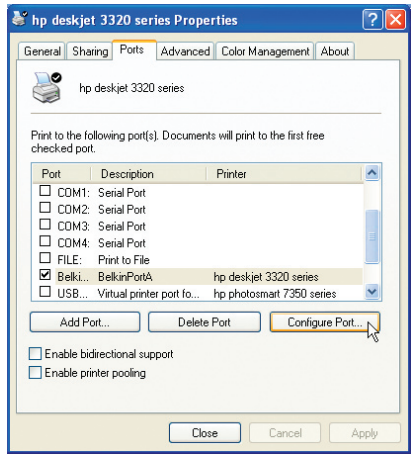
Manually installing the print server port

Advanced users can manually install the Belkin Printer Port without using the Wizard. To do this, from the Installer menu, click “Install Printer Port Only” to skip the Wizard. Belkin has also included a standalone installer on the CD. From the CD, double-click on the file called “instportA.exe”.

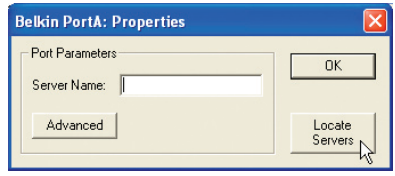
Configuring Computers to Print to the Print Server

1. Install Printer Port Software on each computer by running “instportA.exe” from the CD or by using the Wizard.

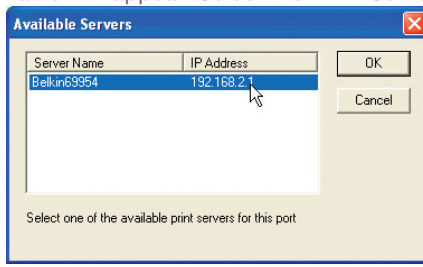
2. Configure the Belkin Port Monitor on each computer’s printer driver to point to the Router’s Print Server as follows:
   a. In Windows, select the printer’s properties for the printer connected to the Print Server and select the “Port” tab, select the Belkin port, and click “Configure Port...”



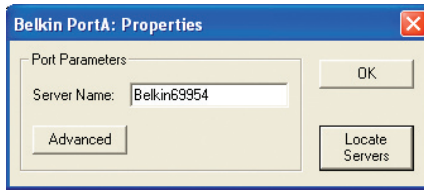
   b. On the “Belkin PortA: Properties” window, click “Locate Servers”.



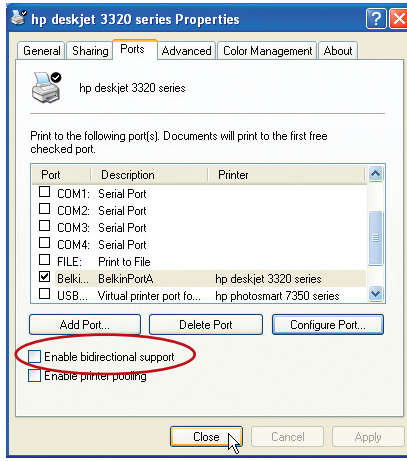
c. On the “Available Servers” window, your Router’s print server name will appear. Select the Print Server. Click “OK” to close.



d. On the “Belkin Port A: Properties” window, the name of the Print Server will appear. Click “OK” to close.



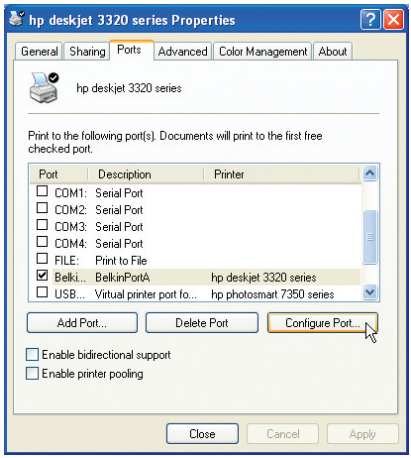
e. On the Ports tab, uncheck the box next to “Enable bidirectional support” if currently checked. Click “Apply”.



f. Click “Close” to close the window.

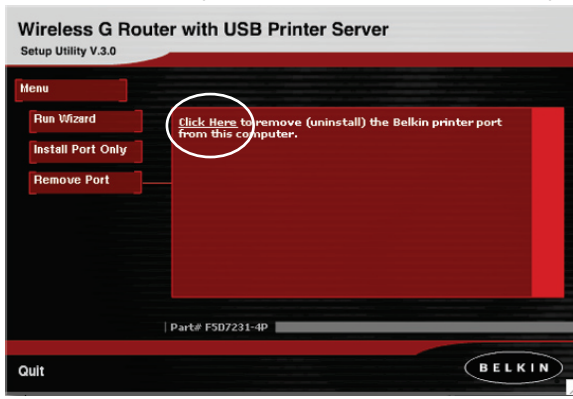
Uninstalling the print server port

1. In Windows, select the printer's properties for the printer connected to the Print Server and select the "Port" tab, select the Belkin port, and click "Configure Port...".



2. Select a different port from the list of available ports. You must select a different port before you can remove the Belkin port.

3. From the Installer menu, click "Remove Printer Port" to uninstall the printer port. Belkin has also provided an uninstaller application that will remove the Belkin printer port from the PC. From the CD, double-click on the file called "rmvportA.exe". This will remove the printer port.

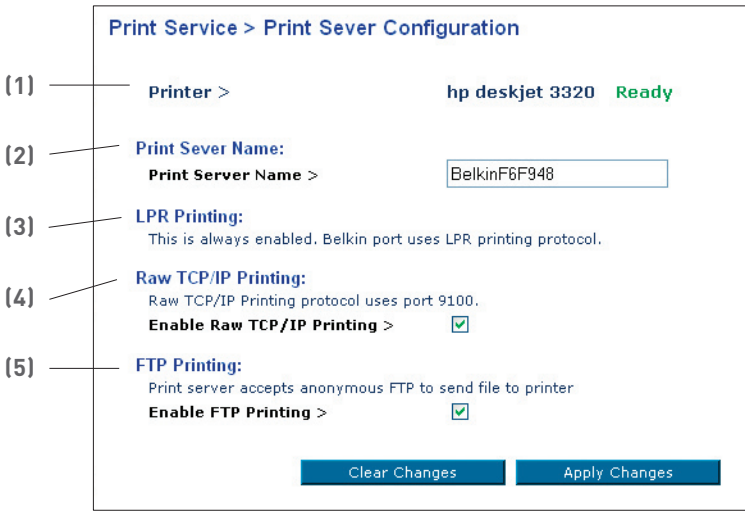


Using the Print Server

Print Server Configuration Screen

For proper operation of the Print Server, install the printer's drivers and software on each computer from which you plan to print. The Belkin Print Server Port must also be installed on each of these computers. See page 26 of this manual for more information and instructions.

The Print Server Configuration screen is the central point in the Router where you can find the printer status (ready/not ready) and make certain adjustments. See page 52 in this manual for directions to access the Advanced Web Based User Interface.



Printer field (1)

This line shows you the name of the printer that is connected to the Print Server and its status.

Print Server Name (2)

The Print Server name identifies the Print Server. If you wish, you can change it by typing in a new name such as "My Print Server" then clicking "Apply Changes".

LPR Printing (3)

The Belkin Printer Port uses LPR as the main printing method.

Raw TCP/IP Printing (4)

This feature allows clients to print to the Print Server using the standard TCP/IP printer port built into Windows XP and 2000, instead of the Belkin Port Monitor. Using Raw Printing requires that you configure all port parameters manually. It is not recommended for users unfamiliar with TCP/IP printing.

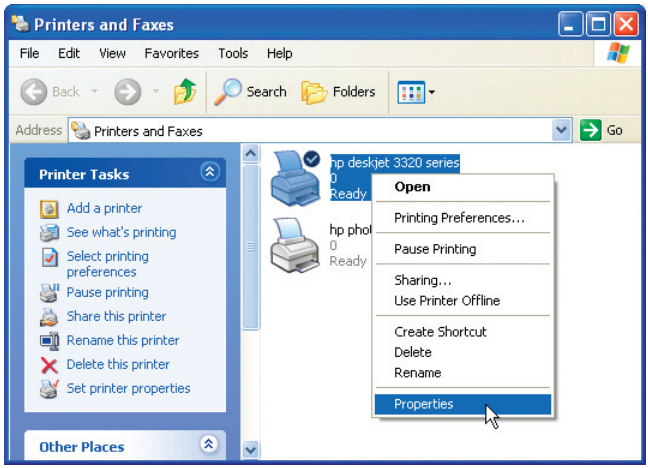
FTP Printing (5)

This feature enables the printer to receive print jobs sent by FTP (see “Using FTP Printing” on this page). Disabling this feature will prevent FTP jobs from printing

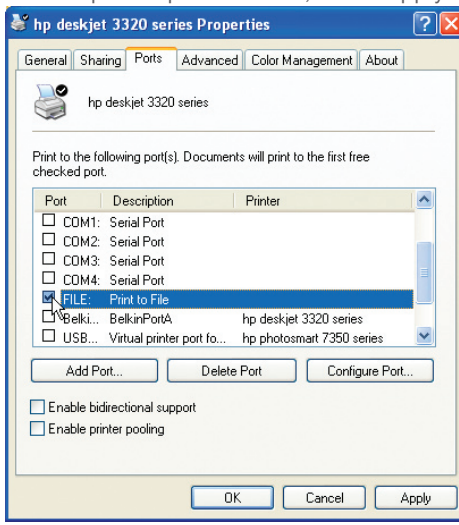
Using FTP Printing

This section describes how to send print jobs to the printer using FTP.

1. In Windows, select the printer’s properties.

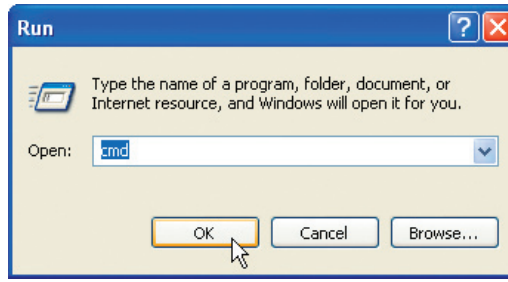


2. Set the printer port to “File”, click “Apply”.

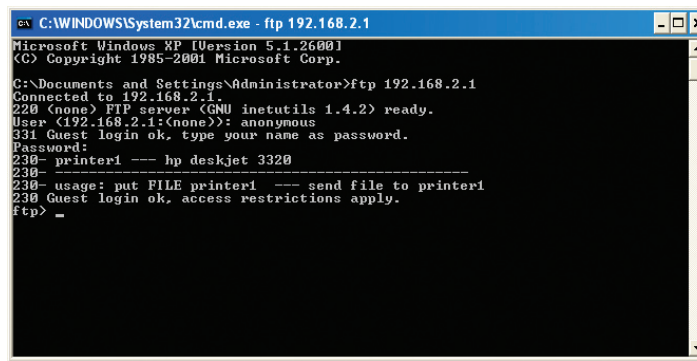


3. Print the document using the printer that you configured. A dialogue box will open prompting you to name the print file. After naming the file, click “OK”. A file will be saved to the user’s default Windows directory (typically “C:\” or “C:\Documents and Settings\<user’s name>”).

4. On the Windows desktop, click “Start>Run” and type in “cmd” for Windows XP and 2000 or “command” for Windows 98SE and Me; click “OK” to open a “Command/MS-DOS Prompt” window.

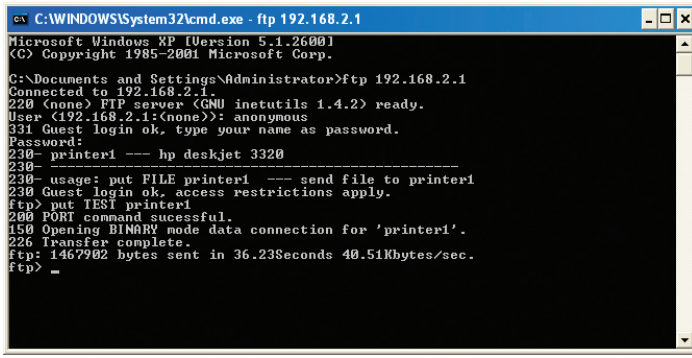


5. At the prompt, type “ftp” followed by the IP address of the Router (default is 192.168.2.1); press the “Enter” key to create an FTP connection with the Print Server.



6. When the connection is made, the user will be prompted to enter a user name and a password. The user name for the Print Server is “anonymous”; the password should be left blank. After a successful login, a list of the printers connected to the Print Server will appear, followed by simple usage instructions for how to print the file.

7. At the prompt, type “put”, followed by the file path and file name, followed by the printer number (for example, “put c:\example printer1”).



8. The file will be sent to the Print Server. When the transfer is complete, another prompt will appear. If finished, type “quit” and press “Enter” to end the FTP session. Then, close the “Command Prompt” window.

Note: FTP Printing by default is enabled in the Print Server. It can be disabled using the Router’s Web-Based Setup Interface. See page 29 for details.

Alternate Setup Method

The Advanced User Interface is a web-based tool that you can use to set up the Router if you don't want to use the Easy Install Wizard. You can also use it to manage advanced functions of the Router. From the Advanced User Interface, you can perform the following tasks:

- View the Router's current settings and status.
- Configure the Router to connect to your ISP with the settings that they provided you.
- Change the current network settings such as the Internal IP address, the IP address pool, DHCP settings and more.
- Set the Router's firewall to work with specific applications (port forwarding).
- Set up security features such as client restrictions, MAC address filtering, WEP and WPA.
- Enable the DMZ feature for a single computer on your network.
- Change the Router's internal password.
- Enable/Disable UPnP (Universal Plug-and-Play).
- Reset the Router.
- Back up your configuration settings.
- Reset the Router's default settings.
- Update the Router's firmware.

Step 1 | Connecting your Router

1.1 Turn off the power to your modem by unplugging the power supply from the modem.

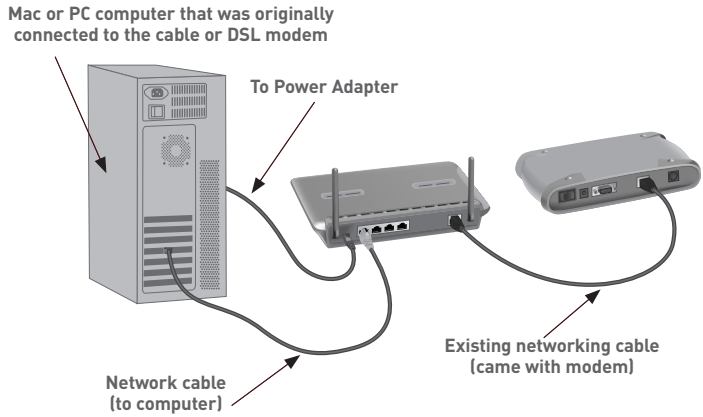
1.2 Locate the network cable that is connected between your modem and your computer and unplug it from your computer, leaving the other end connected to your modem.

1.3 Plug the loose end of the cable you just unplugged into the green port on the back of the Router labeled "Connection to Modem".

1.4 Connect the new blue network cable (included) from the back of the computer to one of the blue ports labeled "1–4". **Note:** It does not matter which numbered port you choose.

Alternate Setup Method

1.5 Turn your cable or DSL modem on by reconnecting the power supply to the modem.



Note: Your Router may have ports in different locations than depicted in the illustration above.

1.6 Before plugging the power cord into the Router, plug the cord into the wall, then plug the cord into the Router's power jack.

1.7 Verify that your modem is connected to the Router by checking the lights on the front of the Router. The green light labeled "WAN" should be ON if your modem is connected correctly to the Router. If it is not, recheck your connections.

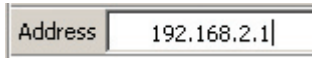
1.8 Verify that your computer is connected properly to the Router by checking the lights labeled "LAN 1,2,3,4". The light which corresponds to the numbered port connected to your computer should be ON, if your computer is connected properly. If it is not, recheck your connections.

Step 2 Set your Computer's Network Settings to Work with a DHCP Server

See the section in this manual called "Manually Configuring Network Settings" for directions.

Step 3 Configuring the Router Using the Web-Based Advanced User Interface

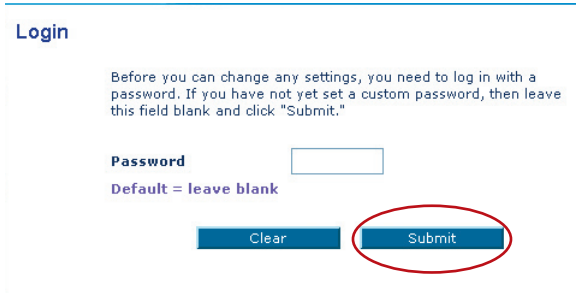
Using your Internet browser, you can access the Router's Web-Based Advanced User Interface. In your browser, type "192.168.2.1" (you do not need to type in anything else such as "http://" or "www"). Then press the "Enter" key.



PLEASE NOTE: If you have difficulty accessing the Router's web-based interface, go to Section 7 of the user manual titled "Manually Configuring Computer Network Settings".

Logging into the Router

You will see the Router's home page in your browser window. The home page is visible to any user who wants to see it. To make any changes to the Router's settings, you have to log in. Clicking the "Login" button or clicking on any one of the links on the home page will take you to the login screen. The Router ships with no password entered. In the login screen, leave the password blank and click the "Submit" button to log in.

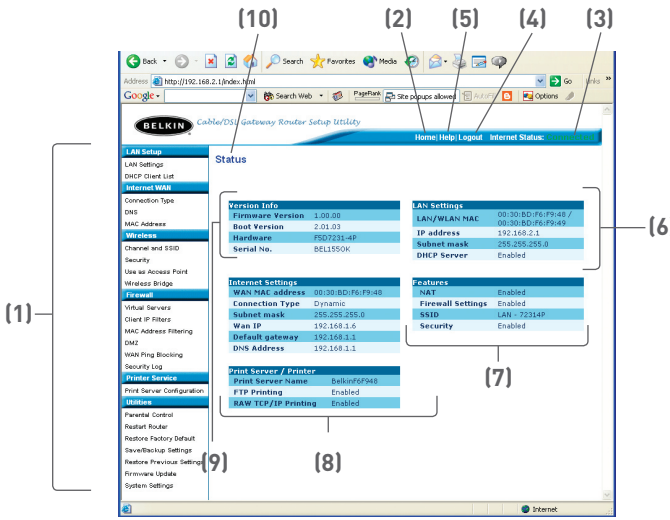


Logging out of the Router

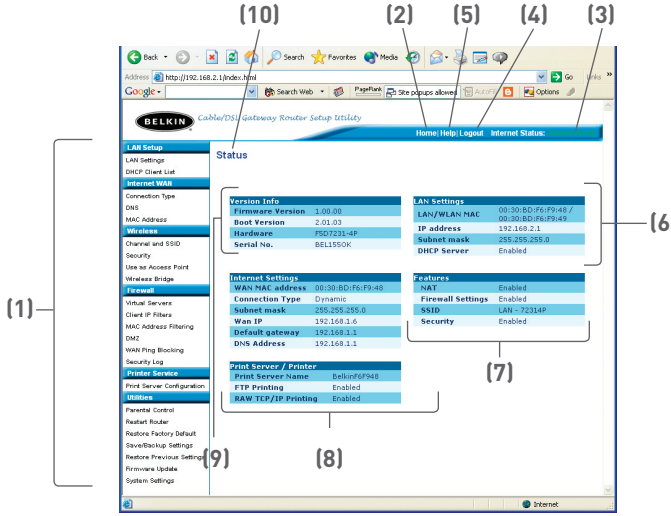
One computer at a time can log in to the Router for the purposes of making changes to the settings of the Router. Once a user has logged in to make changes, there are two ways that the computer can be logged out. Clicking the “Logout” button will log the computer out. The second method is automatic. The login will time out after a specified period of time. The default login time out is 10 minutes. This can be changed from 1 to 99 minutes. For more information, see the section in this manual titled “Changing the Login Timeout Setting”.

Understanding the Web-Based Advanced User Interface

The home page is the first page you will see when you access the Advanced User Interface (UI). The home page shows you a quick view of the Router’s status and settings. All advanced setup pages can be reached from this page.



1. **Quick-Navigation Links**
   You can go directly to any of the Router’s advanced UI pages by clicking directly on these links. The links are divided into logical categories and grouped by tabs to make finding a particular setting easier to find. Clicking on the purple header of each tab will show you a short description of the tab’s function.



2. **Home Button**
   The home button is available in every page of the UI. Pressing this button will take you back to the home page.

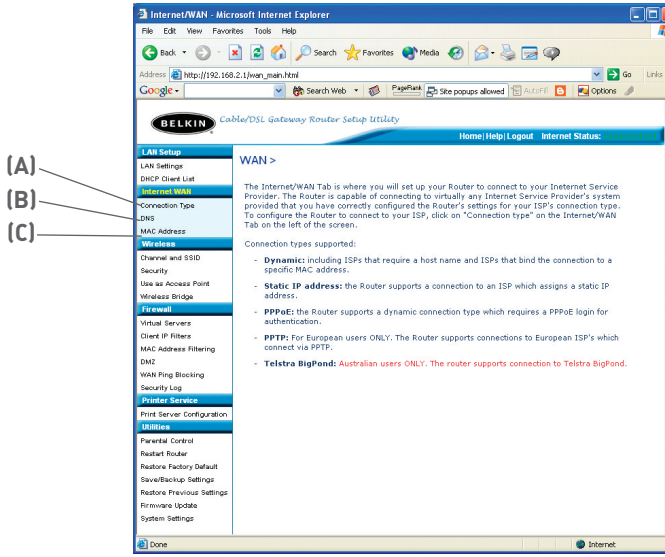
3. **Internet Status Indicator**
   This indicator is visible in all pages of the Router, indicating the connection status of the Router. When the indicator says “connection OK” in GREEN, the Router is connected to the Internet. When the Router is not connected to the Internet, the indicator will read “no connection” in RED. The indicator is automatically updated when you make changes to the settings of the Router.

4. **Login/Logout Button**
   This button enables you to log in and out of the Router with the press of one button. When you are logged into the Router, this button will change to read “Logout”. Logging into the Router will take you to a separate login page where you will need to enter a password. When you are logged in to the Router, you can make changes to the settings. When you are finished making changes, you can log out of the Router by clicking the “Logout” button. For more information about logging into the Router, see the section called “Logging into the Router”.

5. **Help Button**
   The “Help” button gives you access to the Router’s help pages. Help is also available on many pages by clicking “more info” next to certain sections of each page.
6. **LAN Settings**
   Shows you the settings of the Local Area Network (LAN) side of the Router. Changes can be made to the settings by clicking on any one of the links (IP Address, Subnet Mask, DHCP Server) or by clicking the “LAN” Quick Navigation link on the left side of the screen.
7. **Features**
   Shows the status of the Router’s NAT, firewall, and wireless features. Changes can be made to the settings by clicking on any one of the links or by clicking the “Quick Navigation” links on the left side of the screen.
8. **Internet Settings**
   Shows the settings of the Internet/WAN side of the Router that connects to the Internet. Changes to any of these settings can be made by clicking on the links or by clicking on the “Internet/WAN” Quick Navigation link on the left side of the screen.
9. **Version Info**
   Shows the firmware version, boot-code version, hardware version, and serial number of the Router.
10. **Page Name**
    The page you are on can be identified by this name. This manual will sometimes refer to pages by name. For instance “LAN > LAN Settings” refers to the “LAN Settings” page.

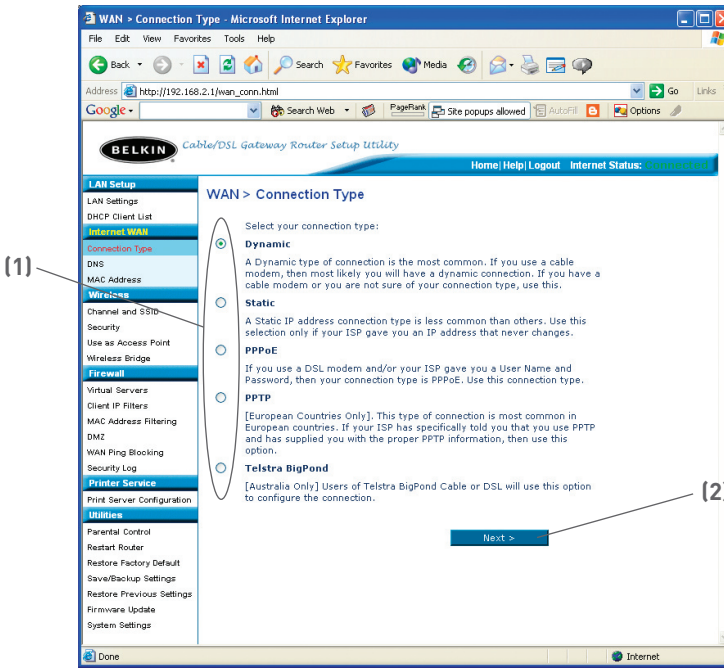
Step 4 Configuring your Router for Connection to your Internet Service Provider (ISP)

The “Internet/WAN” tab is where you will set up your Router to connect to your Internet Service Provider (ISP). The Router is capable of connecting to virtually any ISP’s system provided you have correctly configured the Router’s settings for your ISP’s connection type. Your ISP connection settings are provided to you by your ISP. To configure the Router with the settings that your ISP gave you, click “Connection Type” **(A)** on the left side of the screen. Select the connection type you use. If your ISP gave you DNS settings, clicking “DNS” **(B)** allows you to enter DNS address entries for ISPs that require specific settings. Clicking “MAC address” **(C)** will let you clone your computer’s MAC address or type in a specific WAN MAC address, if required by your ISP. When you have finished making settings, the “Internet Status” indicator will read “connection OK” if your Router is set up properly.



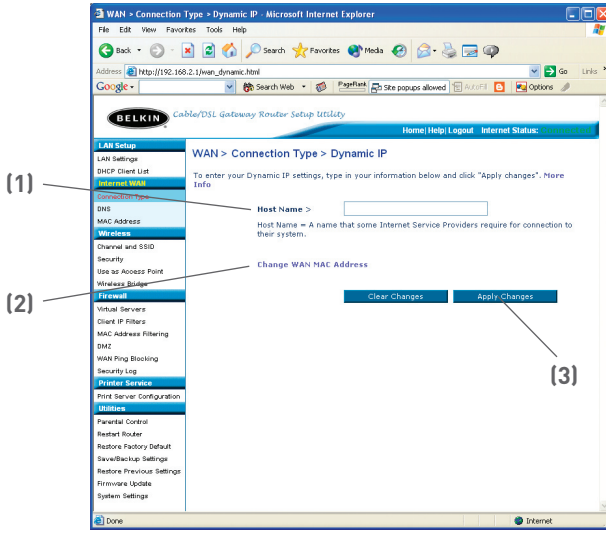
Setting your Connection Type

From the connection type page, you can select the type of connection you use. Select the type of connection you use by clicking the button **(1)** next to your connection type and then clicking “Next” **(2)**.



Setting your Internet Service Provider (ISP) Connection Type to Dynamic IP

A dynamic connection type is the most common connection type found with cable modems. Setting the connection type to “dynamic” in many cases is enough to complete the connection to your ISP. Some dynamic connection types may require a host name. You can enter your host name in the space provided if you were assigned one. Your host name is assigned by your ISP. Some dynamic connections may require that you clone the MAC address of the PC that was originally connected to the modem.

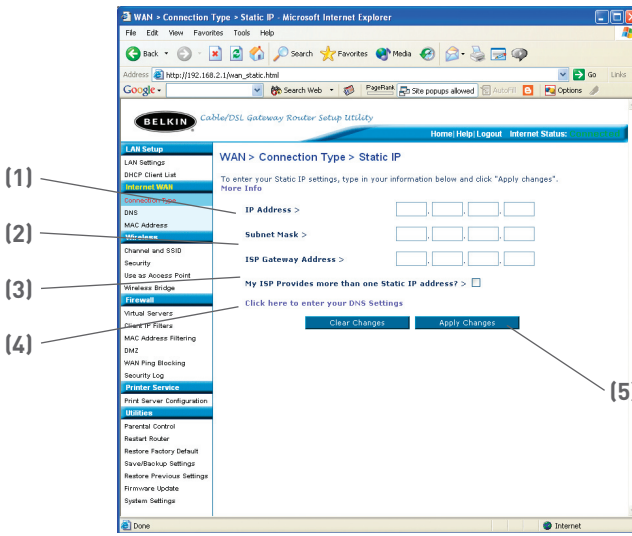


1. **Host Name**
   This space is provided to enter a host name that needs to be visible to your ISP. Enter your host name here and click “Apply Changes” **(3)**. If your ISP did not assign you a host name, or you are not sure, leave this blank.

2. **Change WAN MAC Address**
   If your ISP requires a specific MAC address to connect to the service, you can enter a specific MAC address or clone the current computer’s MAC address through this link.

Setting your Internet Service Provider (ISP) Connection Type to Static IP

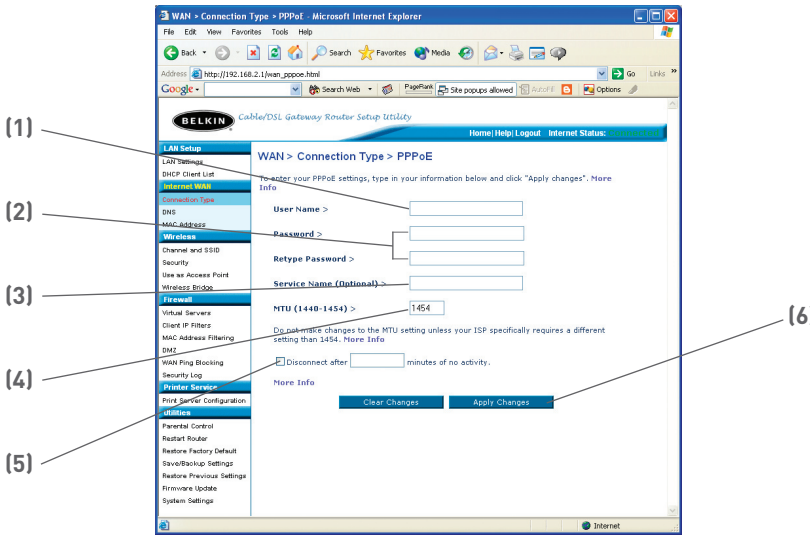
A static IP address connection type is less common than other connection types. If your ISP uses static IP addressing, you will need your IP address, subnet mask, and ISP gateway address. This information is available from your ISP or on the paperwork that your ISP left with you. Type in your information, then click “Apply Changes” **(5)**. After you apply the changes, the Internet Status indicator will read “connection OK” if your Router is set up properly.



1. **IP Address**
   Provided by your ISP. Enter your IP address here.
2. **Subnet Mask**
   Provided by your ISP. Enter your subnet mask here.
3. **ISP Gateway Address**
   Provided by your ISP. Enter the ISP gateway address here.
4. **My ISP Provides More Than One Static IP Address**
   If your ISP assigns you more than one static IP address, your Router is capable of handling up to five static WAN IP addresses. Select “My ISP provides more than one static IP address” and enter your additional addresses.

Setting your ISP connection type to PPPoE

Most DSL providers use PPPoE as the connection type. If you use a DSL modem to connect to the Internet, your ISP may use PPPoE to log you into the service. If you have an Internet connection in your home or small office that doesn't require a modem, you may also use PPPoE.



Your connection type is PPPoE if:

a) Your ISP gave you a user name and password which is required to connect to the Internet

b) Your ISP gave you software such as WinPOET or Enternet300 that you use to connect to the Internet

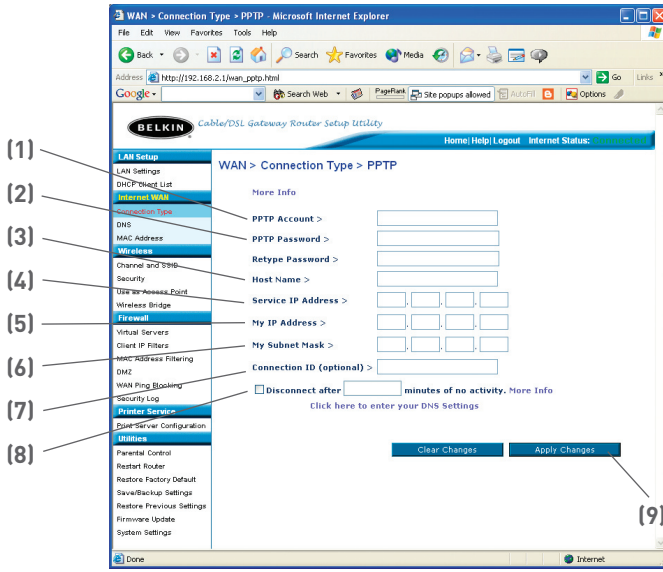
or

c) You have to double-click on a desktop Icon other than your browser to get on the Internet

1. **User Name**
   This space is provided to type in your User name that was assigned by your ISP.
2. **Password**
   Type in your password and re-type it into the “Retype Password” box to confirm it.
3. **Service Name**
   A Service name is rarely required by an ISP. If you are not sure if your ISP requires a service name, leave this blank.
4. **MTU**
   The MTU setting should never be changed unless your ISP gives you a specific MTU setting. Making changes to the MTU setting can cause problems with your Internet connection including disconnection from the Internet, slow Internet access and problems with Internet applications working properly.
5. **Disconnect after X...**
   The Disconnect feature is used to automatically disconnect the router from your ISP when there is no activity for a specified period of time. For instance, placing a checkmark next to this option and entering 5 into the minute field will cause the router to disconnect from the Internet after 5 minutes of no Internet activity. This option should be used if you pay for your Internet service by the minute.

Setting your Internet Service Provider (ISP) Connection Type to Point-to-Point Tunneling Protocol (PPTP)

[European Countries Only]. Some ISPs require a connection using PPTP protocol, a type of connection most common in European countries. This sets up a direct connection to the ISP's system. Type in the information provided by your ISP in the space provided. When you have finished, click "Apply Changes" **(9)**. After you apply the changes, the Internet Status indicator will read "connection OK" if your Router is set up properly.

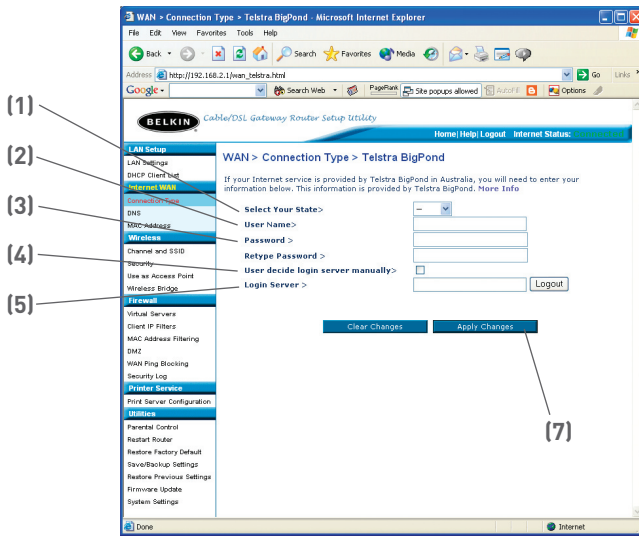


1. **PPTP Account**
   Provided by your ISP. Enter your PPTP account name here.
2. **PPTP Password**
   Type in your password and retype it into the "Retype Password" box to confirm it.
3. **Host Name**
   Provided by your ISP. Enter your host name here.

4. **Service IP Address**
   Provided by your ISP. Enter your service IP address here.
5. **My IP Address**
   Provided by your ISP. Enter the IP address here.
6. **My Subnet Mask**
   Provided by your ISP. Enter the IP address here.
7. **Connection ID (optional)**
   Provided by your ISP. If your ISP did not give you a connection ID, leave this blank.
8. **Disconnect after X....**
   The Disconnect feature is used to automatically disconnect the Router from your ISP when there is no activity for a specified period of time. For instance, placing a check mark next to this option and entering “5” into the minute field will cause the Router to disconnect from the Internet after five minutes of no Internet activity. This option should be used if you pay for your Internet service by the minute.

Setting your Connection Type if you are a Telstra® BigPond User

[Australia Only] Your user name and password are provided to you by Telstra BigPond. Enter this information below. Choosing your state from the drop-down menu **(1)** will automatically fill in your login server IP address. If your login server address is different than one provided here, you may manually enter the login server IP address by placing a check in the box next to “User decide login server manually” **(4)** and type in the address next to “Login Server” **(5)**. When you have entered all of your information, click “Apply Changes” **(7)**. After you apply the changes, the Internet Status indicator will read “connection OK” if your Router is set up properly.

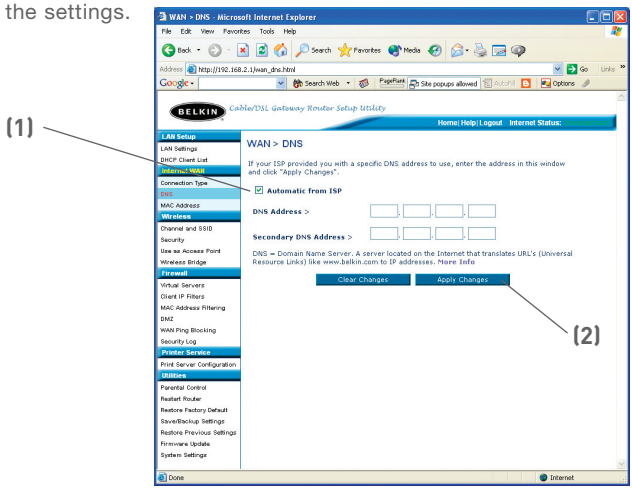


1. **Select your State**
   Select your state from the drop-down menu **(1)**. The “Login Server” box will automatically be filled in with an IP address. If for some reason this address does not match the address that Telstra has given, you can manually enter the login server address. See “User Decide Login Server Manually” **(4)**.
2. **User Name**
   Provided by your ISP. Type in your user name here.

3. **Password**
   Type in your password and retype it into the “Retype Password” box to confirm it.
4. **User Decide Login Server Manually**
   If your login server IP address is not available in the “Select Your State” drop-down menu **(1)**, you may manually enter the login server IP address by placing a check in the box next to “User decide login server manually” and type in the address next to “Login Server” **(5)**.

Setting Custom Domain Name Server (DNS) Settings

A “Domain Name Server” is a server located on the Internet that translates Universal Resource Locater (URLs) like “www.belkin.com” to IP addresses. Many Internet Service Providers (ISPs) do not require you to enter this information into the Router. The “Automatic from ISP” box **(1)** should be checked if your ISP did not give you a specific DNS address. If you are using a static IP connection type, then you may need to enter a specific DNS address and secondary DNS address for your connection to work properly. If your connection type is dynamic or PPPoE, it is likely that you do not have to enter a DNS address. Leave the “Automatic from ISP” box checked. To enter the DNS address settings, uncheck the “Automatic from ISP” box and enter your DNS entries in the spaces provided. Click “Apply Changes” **(2)** to save the settings.



Configuring your WAN Media Access Controller (MAC) Address

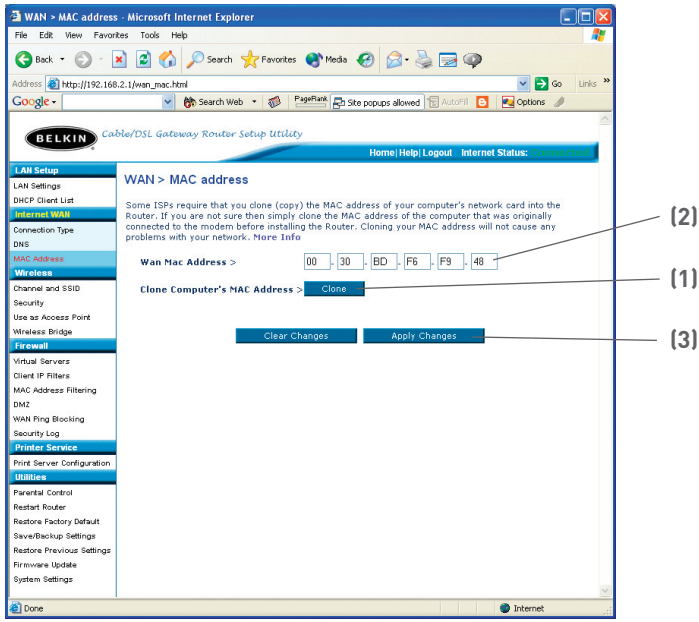
All network components including cards, adapters, and routers, have a unique “serial number” called a MAC address. Your Internet Service Provider may record the MAC address of your computer’s adapter and only let that particular computer connect to the Internet service. When you install the Router, its own MAC address will be “seen” by the ISP and may cause the connection not to work. Belkin has provided the ability to clone (copy) the MAC address of the computer into the Router. This MAC address, in turn, will be seen by the ISP’s system as the original MAC address and will allow the connection to work. If you are not sure whether your ISP needs to see the original MAC address, simply clone the MAC address of the computer that was originally connected to the modem. Cloning the address will not cause any problems with your network.

Cloning your MAC Address

To clone your MAC address, make sure that you are using the computer that was ORIGINALLY CONNECTED to your modem before the Router was installed. Click the “Clone” button **(1)**. Click “Apply Changes” **(3)**. Your MAC address is now cloned to the Router.

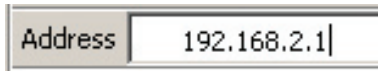
Entering a Specific MAC Address

In certain circumstances you may need a specific WAN MAC address. You can manually enter one in the “MAC Address” page. Type in a MAC address in the spaces provided **(2)** and click “Apply Changes” **(3)** to save the changes. The Router’s WAN MAC address will now be changed to the MAC address you specified.



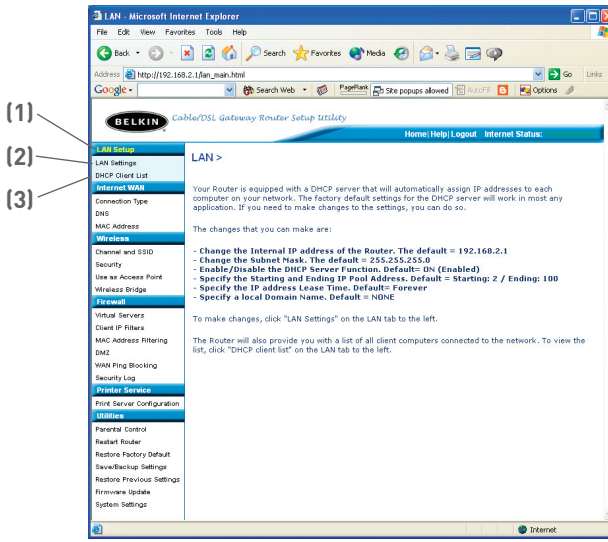
Using your Internet browser, you can access the Router's Web-Based Advanced User Interface. In your browser, type "192.168.2.1" (do not type in anything else such as "http://" or "www") then press the "Enter" key.

You will see the Router's home page in your browser window.



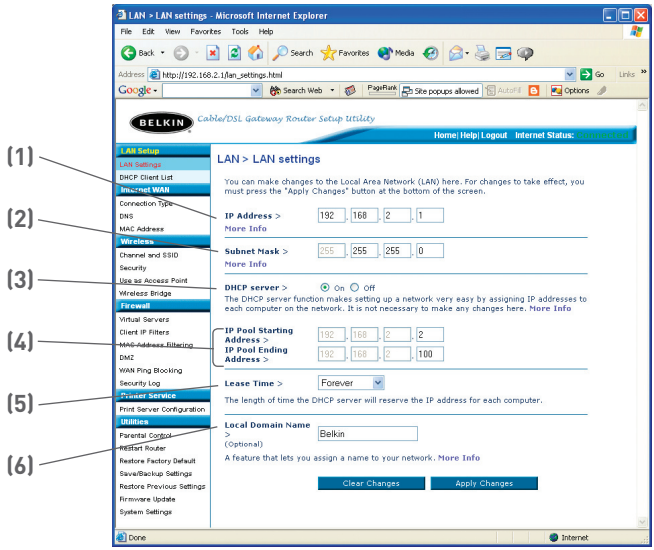
Viewing the LAN Settings

Clicking on the header of the LAN tab **(1)** will take you to the LAN tab's header page. A quick description of the functions can be found here. To view the settings or make changes to any of the LAN settings, click on "LAN Settings" **(2)** or to view the list of connected computers, click on "DHCP Client List" **(3)**.



Changing LAN Settings

All settings for the internal LAN setup of the Router can be viewed and changed here.



1. **IP Address**
   The "IP address" is the internal IP address of the Router. The default IP address is "192.168.2.1". To access the advanced setup interface, type this IP address into the address bar of your browser. This address can be changed if needed. To change the IP address, type in the new IP address and click "Apply Changes". The IP address you choose should be a non-routable IP. Examples of a non-routable IP are:
   192.168.x.x (where x is anything between 0 and 255)
   10.x.x.x (where x is anything between 0 and 255)

2. **Subnet Mask**
   There is no need to change the subnet mask. This is a unique, advanced feature of your Belkin Router. It is possible to change the subnet mask if necessary, however, do **NOT** make changes to the subnet mask unless you have a specific reason to do so. The default setting is "255.255.255.0".

3. **DHCP Server**
   The DHCP server function makes setting up a network very easy by assigning IP addresses to each computer on the network automatically. The default setting is “On”. The DHCP server can be turned OFF if necessary, however, in order to do so you must manually set a static IP address for each computer on your network. To turn off the DHCP server, select “Off” and click “Apply Changes”.

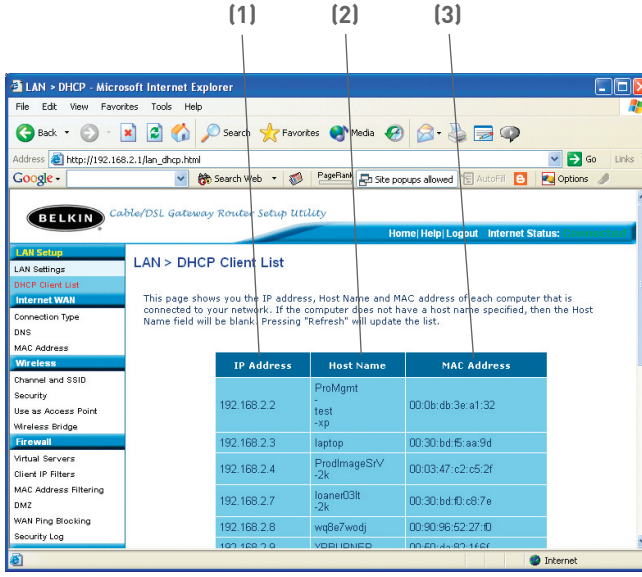
4. **IP Pool**
   The range of IP addresses set aside for dynamic assignment to the computers on your network. The default is 2–100 (99 computers). If you want to change this number, you can do so by entering a new starting and ending IP address and clicking on “Apply Changes”. The DHCP server can assign 100 IP addresses automatically. This means that you cannot specify an IP address pool larger than 100 computers. For example, starting at 50 means you have to end at 150 or lower so as not to exceed the 100-client limit. The starting IP address must be lower in number than the ending IP address.

5. **Lease Time**
   The length of time the DHCP server will reserve the IP address for each computer. We recommend that you leave the lease time set to “Forever”. The default setting is “Forever”, meaning that any time a computer is assigned an IP address by the DHCP server, the IP address will not change for that particular computer. Setting lease times for shorter intervals such as one day or one hour frees IP addresses after the specified period of time. This also means that a particular computer’s IP address may change over time. If you have set any of the other advanced features of the Router such as DMZ or client IP filters, these are dependent on the IP address. For this reason, you will not want the IP address to change.

6. **Local Domain Name**
   The default setting is “Belkin”. You can set a local domain name (network name) for your network. There is no need to change this setting unless you have a specific advanced need to do so. You can name the network anything you want such as “MY NETWORK”.

Viewing the DHCP Client List Page

You can view a list of the computers (known as clients), which are connected to your network. You are able to view the IP address **(1)** of the computer, the host name **(2)** (if the computer has been assigned one), and the MAC address **(3)** of the computer's network interface card (NIC). Pressing the "Refresh" button will update the list. If there have been any changes, the list will be updated.

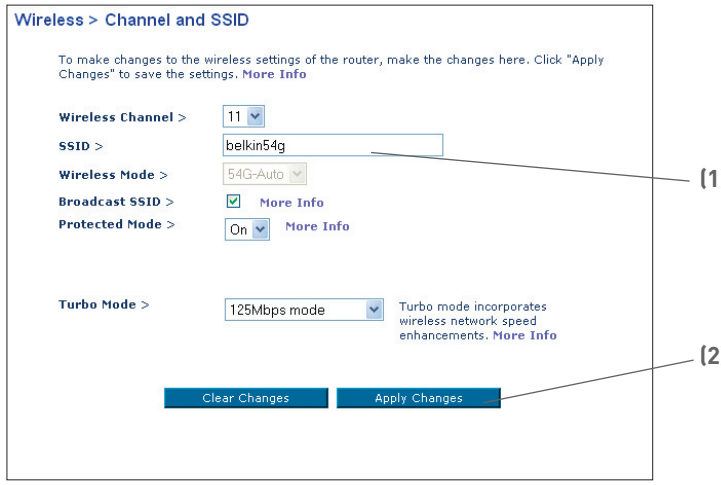


Configuring the Wireless Network Settings

The Wireless tab lets you make changes to the wireless network settings. From this tab you can make changes to the wireless network name (SSID), operating channel, encryption security settings, and configure the Router to be used as an access point.

Changing the Wireless Network Name (SSID)

To identify your wireless network, a name called the SSID (Service Set Identifier) is used. The default SSID of the Router is “belkin54g”. You can change this to anything you want to or you can leave it unchanged. If there are other wireless networks operating in your area, you will want to make sure that your SSID is unique (does not match that of another wireless network in the area). To change the SSID, type in the SSID that you want to use in the SSID field **(1)** and click “Apply Changes” **(2)**. The change is immediate. If you make a change to the SSID, your wireless-equipped computers may also need to be reconfigured to connect to your new network name. Refer to the documentation of your wireless network adapter for information on making this change.



Using the Wireless Mode Switch
Your Router can operate in three different wireless modes: “802.11g-Auto”, “802.11g-Only”, and “802.11g-LRS”. The different modes are explained below.

802.11g-Auto Mode
In this mode, the Router is compatible with 802.11b and 802.11g wireless clients simultaneously. This is the factory default mode and ensures successful operation with all Wi-Fi-compatible devices. If you have a mix of 802.11b and 802.11g clients in your network, we recommend setting the Router to 802.11g-Auto mode. This setting should only be changed if you have a specific reason to do so.

802.11g-Only Mode
802.11g-Only mode works with 802.11g clients only. This mode is recommended only if you want to prevent 802.11b clients from accessing your network. To switch modes, select the desired mode from the “Wireless Mode” drop-down box. Then, click “Apply Changes”.

802.11g-LRS Mode
We recommend you DO NOT use this mode unless you have a very specific reason to do so. This mode exists only to solve unique problems that may occur with some 802.11b client adapters and is NOT necessary for interoperability of 802.11g and 802.11b standards.

When to Use 802.11g-LRS Mode
In some cases, older 802.11b clients may not be compatible with 802.11g wireless. These adapters tend to be of inferior design and may use older drivers or technology. 802.11g-LRS (Limited Rate Support) allows these clients to be compatible with the newer 802.11g technology. Switching to this mode can solve problems that sometimes occur with these clients. If you suspect that you are using a client adapter that falls into this category of adapters, first check with the adapter vendor to see if there is a driver update. If there is no driver update available, switching to 802.11g-LRS mode may fix your problem. **Please note that switching to 802.11g-LRS mode may decrease 802.11g performance slightly**.

Using High-Speed Mode

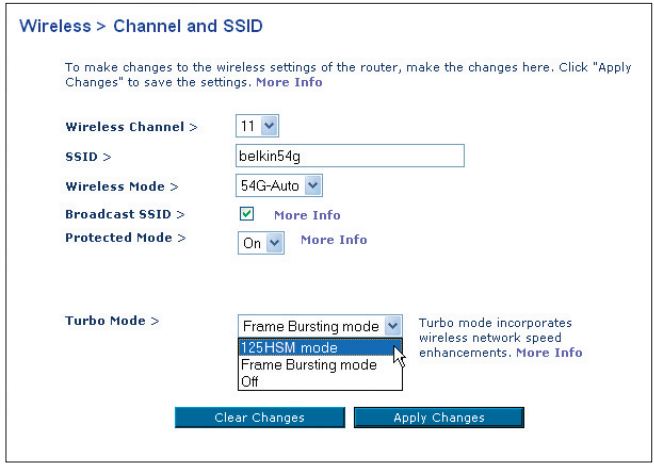
The Router supports two High-Speed modes, 125HSM* mode and Frame Bursting mode.

Selecting “125HSM mode” will result in all devices running in 125HSM mode if all devices are capable of 125Mbps speeds. If any non-125HSM device connects or associates with the network, the Router will automatically shift the entire network back to Frame Bursting mode.

Selecting “Frame Bursting” will result in all devices capable of Frame Bursting to function in Frame Bursting mode, and all clients not capable, to operate in normal 802.11g modes. Frame Bursting mode supports both Frame Bursting-enabled devices and non-Frame Bursting-enabled devices simultaneously. Frame Bursting mode is based on the unreleased 802.11e specification.

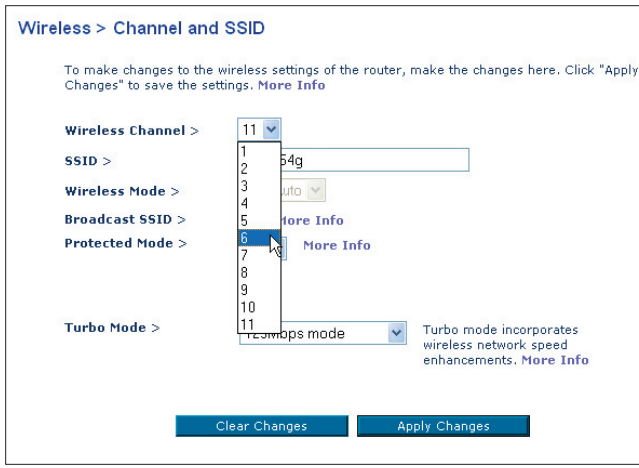
Selecting “Off” will disable Turbo mode.

*When operating in High-Speed Mode, this Wi-Fi device may achieve an actual throughput of up to or greater than 34.1Mbps, which is the equivalent throughput of a system following 802.11g protocol and operating at a signaling rate of 125Mbps. Actual throughput will vary depending on environmental operational and other factors.



Changing the Wireless Channel

There are a number of operating channels you can choose from. In the United States and Australia, there are 11 channels. In the United Kingdom and most of Europe, there are 13 channels. In a small number of other countries, there are other channel requirements. Your Router is configured to operate on the proper channels for the country you reside in. The default channel is 11 (unless you are in a country that does not allow channel 11). The channel can be changed if needed. If there are other wireless networks operating in your area, your network should be set to operate on a channel that is different than the other wireless networks. For best performance, use a channel that is at least five channels away from the other wireless network. For instance, if another network is operating on channel 11, then set your network to channel 6 or below. To change the channel, select the channel from the drop-down list. Click “Apply Changes”. The change is immediate.

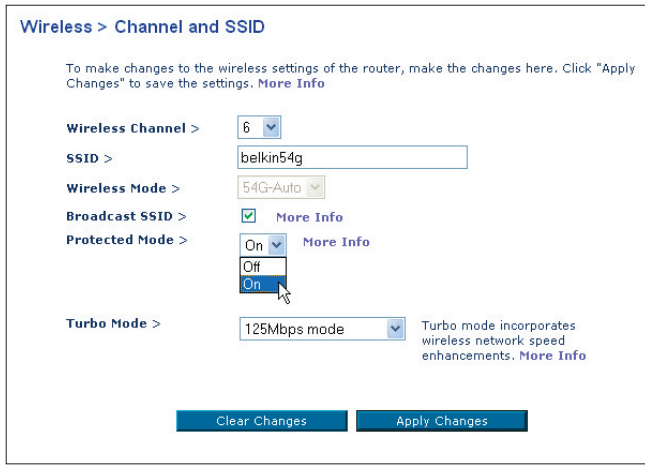


Using the Broadcast SSID Feature

Note: This advanced feature should be employed by advanced users only.
For security, you can choose not to broadcast your network's SSID. Doing so will keep your network name hidden from computers that are scanning for the presence of wireless networks. To turn off the broadcast of the SSID, remove the check mark from the box next to "Broadcast SSID", and then click "Apply Changes". The change is immediate. Each computer now needs to be set to connect to your specific SSID; an SSID of "ANY" will no longer be accepted. Refer to the documentation of your wireless network adapter for information on making this change.

Protected Mode Switch

As part of the 802.11g specification, Protected Mode ensures proper operation of 802.11g clients and access points when there is heavy 802.11b traffic in the operating environment. When Protected mode is ON, 802.11g scans for other wireless network traffic before it transmits data. Therefore, using this mode in environments with HEAVY 802.11b traffic or interference achieves best performance results. If you are in an environment with very little—or no—other wireless network traffic, your best performance will be achieved with Protected mode OFF.



Securing your Wi-Fi® Network

Here are a few different ways you can maximize the security of your wireless network and protect your data from prying eyes and ears. This section is intended for the home, home office, and small office user. At the time of this manual's publication, there are three encryption methods available.

Name	64-bit Wired Equivalent Privacy	128-bit Wired Equivalent Privacy	Wi-Fi Protected Access-TKIP	With Protected Access
Acronym	64-bit WEP	128-bit WEP	WPA-TKIP	WPA-AES
Security	Good	Better	Best	Best
Features	Static keys	Static keys	Dynamic key encryption and mutual authentication.	Dynamic key encryption and mutual authentication.
	Encryption keys based on RC4 algorithm (typically 40-bit keys)	More secure than 64-bit WEP using a key length of 104 bits plus 24 additional bits of system generated data.	TKIP (temporal key integrity protocol) added so that keys are rotated and encryption is strengthened.	AES (Advanced Encryption Standard) does not cause any throughput loss.

WEP (Wired Equivalent Privacy)

WEP (Wired Equivalent Privacy) is a common protocol that adds security to all Wi-Fi-compliant wireless products. WEP was designed to give wireless networks the equivalent level of privacy protection as a comparable wired network.

64-Bit WEP

64-bit WEP was first introduced with 64-bit encryption, which includes a key length of 40 bits plus 24 additional bits of system-generated data (64 bits total). Some hardware manufacturers refer to 64-bit as 40-bit encryption. Shortly after the technology was introduced, researchers found that 64-bit encryption was too easy
to decode.

128-Bit WEP

As a result of 64-bit WEP's potential security weaknesses, a more secure method of 128-bit encryption was developed. 128-bit encryption includes a key length of 104 bits plus 24 additional bits of system-generated data (128 bits total). Some hardware manufacturers refer to 128-bit as 104-bit encryption.

Most of the new wireless equipment in the market today supports both 64-bit and 128-bit WEP encryption, but you might have older equipment that only supports 64-bit WEP. All Belkin wireless products will support both 64-bit and 128-bit WEP.

Encryption Keys

After selecting either the 64-bit or 128-bit WEP encryption mode, it is critical that you generate an encryption key. If the encryption key is not consistent throughout the entire wireless network, your wireless networking devices will be unable to communicate with one another on your network and you will not be able to successfully communicate within your network.

You can enter your key by typing in the hex key manually, or you can type in a passphrase in the "Passphrase" field and click "Generate" to create a key. A hex (hexadecimal) key is a mixture of numbers and letters from A–F and 0–9. For 64-bit WEP, you need to enter 10 hex keys. For 128-bit WEP, you need to enter 26 hex keys.

For instance:

AF 0F 4B C3 D4 = 64-bit WEP key

C3 03 0F AF 0F 4B B2 C3 D4 4B C3 D4 E7 = 128-bit WEP key

The WEP passphrase is NOT the same as a WEP key. Your card uses this passphrase to generate your WEP keys, but different hardware manufacturers might have different methods on generating the keys. If you have multiple vendors' equipments in your network, the easiest thing to do is to use the hex WEP key from your Router or access point and enter it manually into the hex WEP key table in your card's configuration screen.

WPA (Wi-Fi Protected Access)
WPA (Wi-Fi Protected Access) is a new Wi-Fi standard that was designed to improve upon the security features of WEP. To use WPA security, the drivers and software of your wireless equipment must be upgraded to support WPA. These updates will be found on the wireless vendors website. There are two types of WPA security, WPA-PSK (no server) and WPA (with radius server).

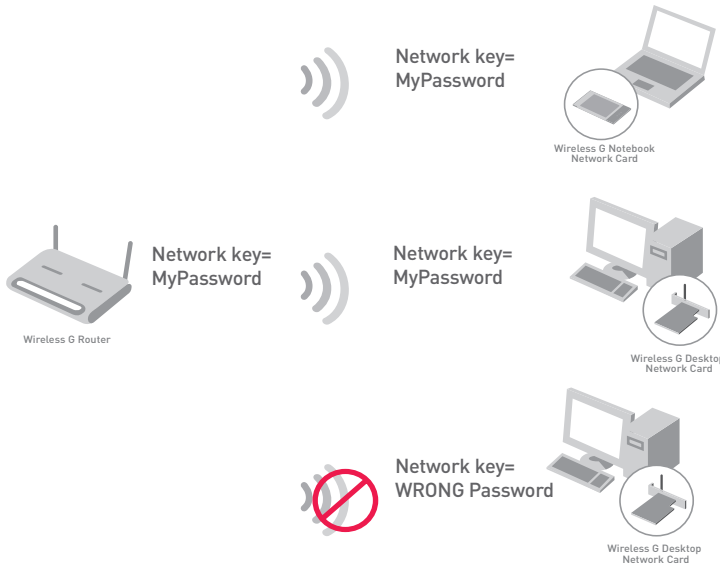
WPA-PSK (no server) uses what is known as a Pre-Shared key as the Network key. A Network key is basically a password that is between 8 and 63 characters long. It can be a combination of letters, numbers, or characters. Each client uses the same Network key to access the network. Typically, this is the mode that will be used in a home environment.

WPA (with radius server) is a system where a radius server distributes the Network key to the clients automatically. This is typically found in a business environment.

For a list of Belkin wireless products that support WPA, please visit our website at **www.belkin.com/networking.**

Sharing the Same Network Keys

Most Wi-Fi products ship with security turned off. So once you have your network working, you need to activate WEP or WPA and make sure your wireless networking devices are sharing the same Network key.



The Wireless G Desktop Network Card cannot access the network because it is using a different Network key than the Network key that is configured on the Wireless G Router.

Using a Hexadecimal Key

A hexadecimal key is a mixture of numbers and letters from A–F and 0–9. 64-bit keys are five two-digit numbers. 128-bit keys are 13 two-digit numbers.

For instance:

AF 0F 4B C3 D4 = 64-bit key

C3 03 0F AF 0F 4B B2 C3 D4 4B C3 D4 E7 = 128-bit key

In the boxes below, make up your key by writing in two characters between A–F and 0–9 in each box. You will use this key to program the encryption settings on your Router and your wireless computers.

Note to Mac users: Original Apple AirPort® products support 64-bit encryption only. Apple AirPort 2 products can support 64-bit or 128-bit encryption. Please check your product to see which version you are using. If you cannot configure your network with 128-bit encryption, try 64-bit encryption.

WEP Setup

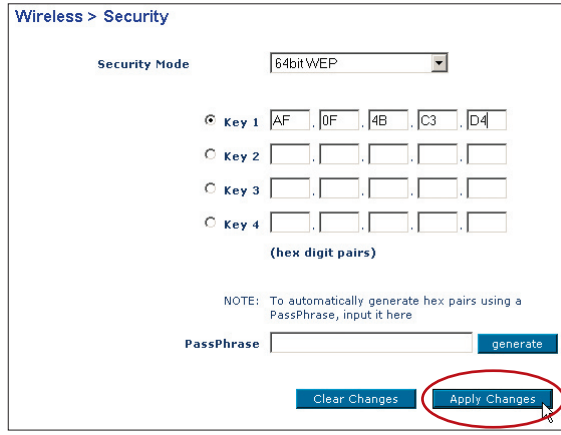
64-Bit WEP Encryption

1 Select “64-bit WEP” from the drop-down menu.

2. After selecting your WEP encryption mode, you can enter your key by typing in the hex key manually, or you can type in a passphrase in the “Passphrase” field and click “Generate” to create a key.

   A hex (hexadecimal) key is a mixture of numbers and letters from A–F and 0–9. For 64-bit WEP, you need to enter 10 hex keys.

   For instance:
   AF 0F 4B C3 D4 = 64-bit WEP key



3. Click “Apply Changes” to finish. Encryption in the Router is now set. Each of your computers on your wireless network will now need to be configured with the same security settings.

WARNING: If you are configuring the Wireless Router or Access Point from a computer with a wireless client, you will need to ensure that security is turned ON for this wireless client. If this is not done, you will lose your wireless connection.

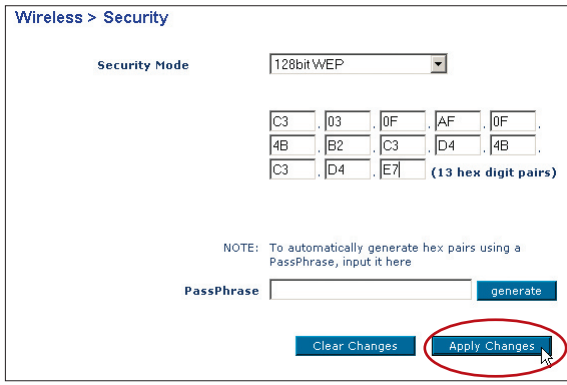
128-Bit WEP Encryption

Note to Mac® users: The Passphrase option will not operate with Apple® AirPort®. To configure encryption for your Mac computer, set the encryption using the manual method described in the next section.

1. Select "128-bit WEP" from the drop-down menu.
2. After selecting your WEP encryption mode, you can enter your key manually by typing in the hex key manually, or you can type in a passphrase in the "Passphrase" field and click "Generate" to create a key.

   A hex (hexadecimal) key is a mixture of numbers and letters from A–F and 0–9. For 128-bit WEP, you need to enter 26 hex keys.

   For instance:
   C3 03 0F AF 0F 4B B2 C3 D4 4B C3 D4 E7 = 128-bit WEP key



3. Click "Apply Changes" to finish. Encryption in the Router is now set. Each of your computers on your wireless network will now need to be configured with the same security settings.

WARNING: If you are configuring the Wireless Router or Access Point from a computer with a wireless client, you will need to ensure that security is turned ON for this wireless client. If this is not done, you will lose your wireless connection.

Changing the Wireless Security Settings

Your Router is equipped with WPA (Wireless Protected Access), the latest wireless security standard. It also supports the legacy security standard, WEP (Wired Equivalent Privacy). By default, wireless security is disabled. To enable security, you must first determine which standard you want to use. To access the security settings, click "Security" on the Wireless tab.

WPA Setup

Note: To use WPA security, all your clients must be upgraded to drivers and software that support it. At the time of this manual's publication, a security patch download is available, for free, from Microsoft. This patch works only with the Windows XP operating system. You also need to download the latest driver for your Belkin Wireless G Desktop or Notebook Network Card from the Belkin support site. Other operating systems are not supported at this time. Microsoft's patch only supports devices with WPA-enabled drivers such as Belkin 802.11g products.

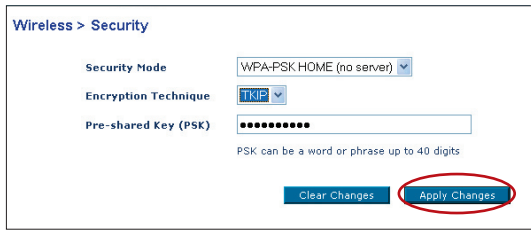
There are two types of WPA security: WPA-PSK (no server) and WPA (with radius server). WPA-PSK (no server) uses a so-called Pre-Shared key as the security key. A Pre-Shared key is a password that is between 8 and 63 characters long. It can be a combination of letters, numbers, and other characters. Each client uses the same key to access the network. Typically, this mode will be used in a home environment.

WPA (with radius server) is a configuration wherein a radius server distributes the keys to the clients automatically. This is typically used in a business environment.

Setting WPA-PSK (no server)

1. From the "Security Mode" drop-down menu, select "WPA-PSK (no server)".
2. For Encryption Technique, select "TKIP" or "AES". This setting will have to be identical on the clients that you set up.
3. Enter your pre-shared key. This can be from 8 to 63 characters and can be letters, numbers, or symbols. This same key must be used on all of the clients that you set up. For example, your PSK might be something like: "Smith family network key".

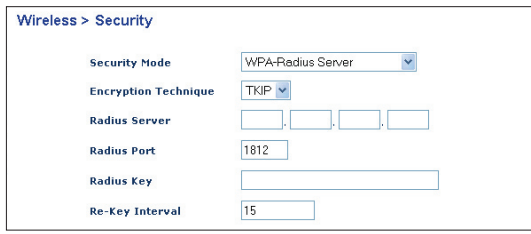
4. Click “Apply Changes” to finish. You must now set all clients to match these settings.



Setting WPA (with radius server) Settings

If your network uses a radius server to distribute keys to the clients, use this setting.

1. From the “Security Mode” drop-down menu, select “WPA—Radius Server”.
2. For Encryption Technique, select “TKIP” or “AES”. This setting will have to be identical on the clients that you set up.
3. Enter the IP address of the radius server into the “Radius Server” fields.
4. Enter the radius key into the “Radius Key” field.
5. Enter the key interval. Key interval is how often the keys are distributed (in packets).
6. Click “Apply Changes” to finish. You must now set all clients to match these settings.



Configuring your Belkin Wireless G Network Cards to Use Security

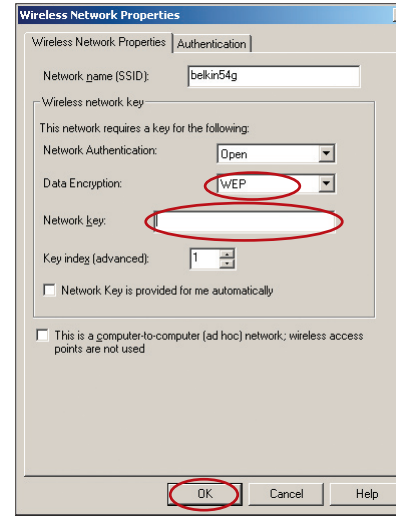
Please Note: This section is to provide you with the information on how to configure your Belkin Wireless G Network Cards to use security.

At this point, you should already have your Wireless Router or Access Point set to use WPA or WEP. In order for you to gain a wireless connection, you will need to set your wireless notebook card and wireless desktop card to use the same security settings.

Connecting your Computer to a Wireless Network that Requires a 64-bit or 128-bit WEP key:

1. Double-click the Signal Indicator icon to bring up the Wireless Network screen. The Advanced button will allow you to view and configure more options of your card.
2. Under the “Wireless Network Properties” tab, select a network name from the “Available networks” list and click “Configure”.
3. Under “Data Encryption” select “WEP”.
4. Ensure the check box “Network key is provided for me automatically” at the bottom is unchecked. If you are using this computer to connect to a corporate network, please consult your network administrator if this box needs to be checked.
5. Type your WEP key in the “Network key” box.

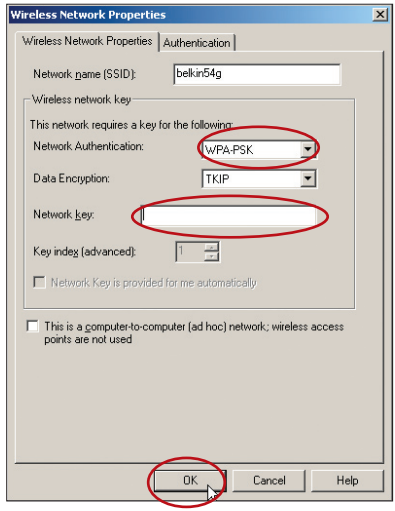
Important: A WEP key is a mixture of numbers and letters from A–F and 0–9. For 128-bit WEP, you need to enter 26 keys. For 64-bit WEP, you need to enter 10 keys. This Network key needs to match the key you assign to your Wireless Router or Access Point.



6. Click “OK” to save the settings.

Connecting your Computer to a Wireless Network that Requires WPA-PSK (no server)

1. Double-click the “Signal Indicator” icon to bring up the “Wireless Network” screen. The Advanced button will allow you to view and configure more options of your card.
2. Under the “Wireless Networks” tab, select a network name from the “Available networks” list and click “Configure”.
3. Under “Network Authentication” select “WPA-PSK (No Server)”.
4. Type your WPA key in the “Network key” box.



Important: WPA-PSK is a mixture of numbers and letters from A–Z and 0–9. For WPA-PSK you can enter 8 to 63 keys. This Network key needs to match the key you assign to your Wireless Router or Access Point.

5. Click “OK” to save the settings.

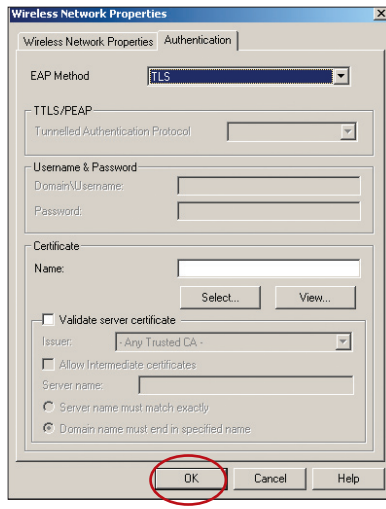
Connecting your Computer to a Wireless Network that Requires WPA (with radius server)

1. Double-click the Signal Indicator icon to bring up the “Wireless Network” screen. The “Advanced” button will allow you to view and configure more options of your Card.

2. Under the “Wireless Networks” tab, select a network name from the “Available networks” list and click “Configure”.

3. Under “Network Authentication” select WPA.

4. Under the “Authentication” tab, select the settings that are indicated by your network administrator.



5. Click “OK” to save the settings.

Setting Up WPA for a Non-Belkin Wireless Desktop and Wireless Notebook Cards

For non-Belkin WPA Wireless Desktop and Wireless Notebook Cards that are not equipped with WPA-enabled software, a file from Microsoft called “Windows XP Support Patch for Wireless Protected Access” is available for free download.

Please Note: The file that Microsoft has made available works only with Windows XP. Other operating systems are not supported at this time.

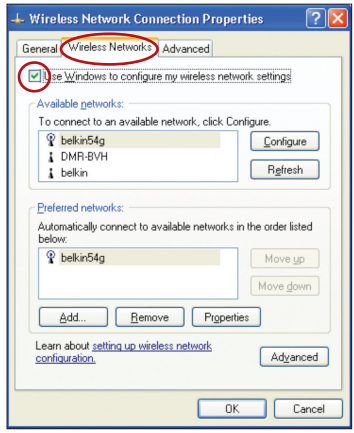
Important: You also need to ensure that the wireless card manufacturer supports WPA and that you have downloaded and installed the latest driver from their support site.

Supported Operating Systems:
- Windows XP Professional
- Windows XP Home Edition

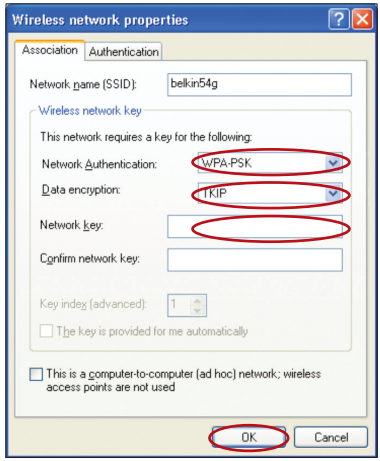
Setting Up Windows XP Wireless Network Utility to Use WPA-PSK

In order to use WPA-PSK, ensure you are using Windows Wireless Network Utility by doing the following:

1. Under Windows XP, click “Start > Control Panel > Network Connections”.
2. Right-click on “Wireless Network Connection”, and select “Properties”.
3. Clicking on the “Wireless Networks” tab will display the following screen. Ensure the “Use Windows to configure my wireless network settings” check box is checked.



4. Under the Wireless Networks tab, click the “Configure” button, and you will see the following screen.



5. For a home or small business user, select “WPA-PSK” under “Network Authentication”.

   Note: Select “WPA” if you are using this computer to connect to a corporate network that supports an authentication server such as a radius server, please consult your network administrator for further information.

6. Select “TKIP” or “AES” under “Data Encryption”. This setting will have to be identical to the Router that you set up.

7. Type in your encryption key in the “Network Key” box.

Important: Enter your Pre-Shared key. This can be from 8 to 63 characters and can be letters, numbers, or symbols. This same key must be used on all of the clients that you set up.

8. Click “OK” to apply settings.

Using the Access Point Mode

Note: This advanced feature should be employed by advanced users only. The Router can be configured to work as a wireless network access point. Using this mode will defeat the NAT IP sharing feature and DHCP server. In Access Point (AP) mode, the Router will need to be configured with an IP address that is in the same subnet as the rest of the network that you will bridge to. The default IP address is 192.168.2.254 and subnet mask is 255.255.255.0. These can be customized for your need.

1. Enable the AP mode my selecting “Enable” in the “Use as Access Point only” page. When you select this option, you will be able to change the IP settings.
2. Set your IP settings to match your network. Click “Apply Changes”.
3. Connect a cable from the WAN port on the Router to your existing network.

The Router is now acting as an access point. To access the Router’s advanced user interface again, type the IP address you specified into your browser’s navigation bar. You can set the encryption settings, MAC address filtering, SSID, and channel normally.

Wireless Range Extension and Bridging

Wireless Range Extension and Bridging works with the following models only:

F5D7231-4P High-Speed Mode Wireless G Router with Built-In USB Print Server
F5D7231-4 High-Speed Mode Wireless G Router
F5D7230-4 Wireless Router
F5D7235-4 High-Speed Mode Wireless G Gigabit Router
F5D7130 Wireless Range Extender/Access Point

Please make sure to download the latest firmware version for the Router or Access Point for optimal performance: **http://web.belkin.com/support**

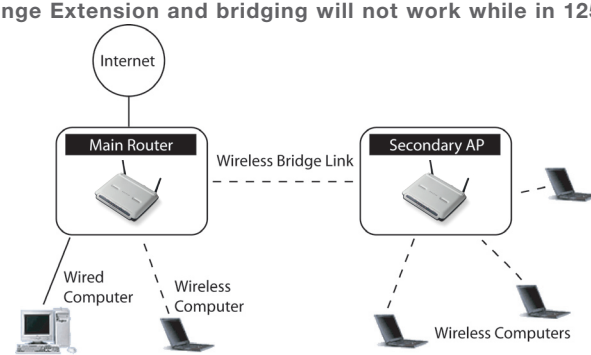
What is a Wireless Bridge?

A wireless bridge is actually a “mode” in which your Wireless Router can directly connect to a secondary Wireless Access Point. Note that you can only bridge your Wireless G Router (model F5D7230-4, F5D7235-4, F5D7231-4P, F5D7231-4) to a Belkin Wireless G Range Extender/Access Point (model F5D7130). Bridging with access points of other manufacturers is not supported at this time. You can use the bridge mode to extend the range of your wireless network, or add an extension of your network in another area of your office or home without running cables.

Range Extension

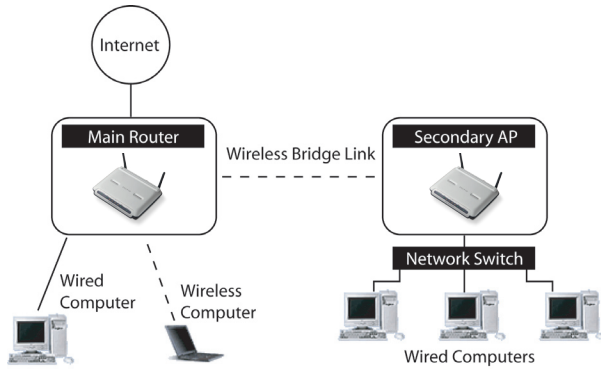
Range extension will extend the wireless coverage area in your home or office. The example on the next page illustrates use of bridging to extend the range of your wireless network. In this example, the Router is set up to connect to an Access Point located in another area. Laptops can roam, or move between the two wireless coverage areas.

***Wireless Range Extension and bridging will not work while in 125 HSM mode.**



Adding Another Network Segment Wirelessly

Bridging an Access Point to your Wireless Router allows you to add another network segment in another area in the home or office without running wires. Connecting a network switch or hub to the Access Point's RJ45 jack will allow a number of computers connected to the switch access to the rest of the network.



Setting Up a Bridge Between your Wireless Router and a Secondary Access Point

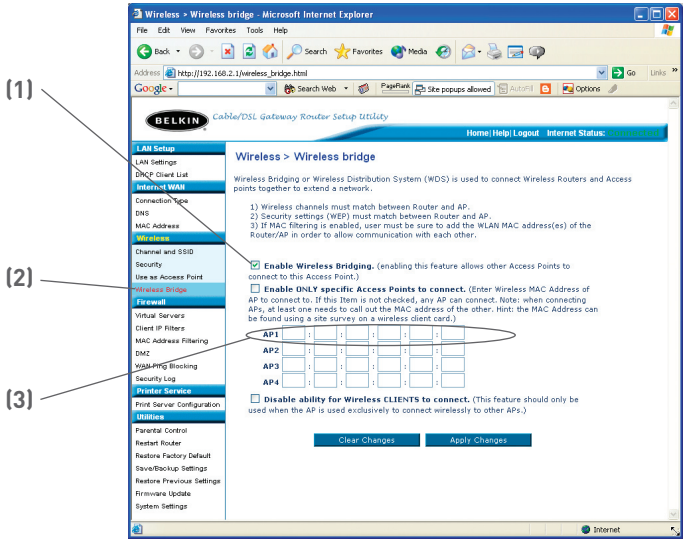
Bridging your Belkin Router to a secondary Access Point requires that you access the Router's Advanced Setup Utility and enter the MAC address of the Access Point in the appropriate area. There are also a few other requirements. **PLEASE BE SURE TO FOLLOW THE STEPS BELOW, CAREFULLY.**

1. Set your Access Point to the same channel as the Router. By default, the Router and Access Point channels are set to channel 11 at the factory. If you have never changed the channel, you don't need to do anything (for more information on changing channels, see page 47 of this manual).
2. Find the Access Point's MAC address on the bottom of the Access Point. There are two MAC addresses on the bottom label. You will need the MAC address named "WLAN MAC Address". The MAC address starts with 0030BD or 001150 and is followed by six other numbers or letters (i.e. 0030BD-XXXXXX). Write the MAC address below. Go to the next step.

3. Place your secondary Access Point within range of your Wireless Router and near the area where you want to extend the range or add the network segment. Typically, indoor range should be between 100 and 200 feet.
4. Connect power to your Access Point. Make sure the Access Point is on and proceed to the next step.

5. From a computer already connected to your Router, access the Advanced Setup Utility by opening your browser. In the address bar, type in “192.168.2.1”. Do not type in “www” or “http://” before the number. **Note:** If you have changed your Router’s IP address, use that IP address.

6. You will see the Router’s user interface in the browser window. Click “Wireless Bridge” **(2)** on the left-hand side of the screen. You will see the following screen.



7. Check the box that says “Enable ONLY specific Access Points to connect” **(1)**.

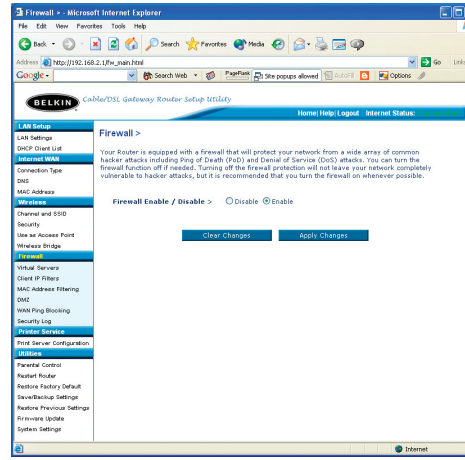
8. In the field named AP1 **(3)**, type in the MAC address of your secondary Access Point. When you have typed in the address, click “Apply Changes”.

9. Bridging is now set up.

Configuring the Firewall

Your Router is equipped with a firewall that will protect your network from a wide array of common hacker attacks including:

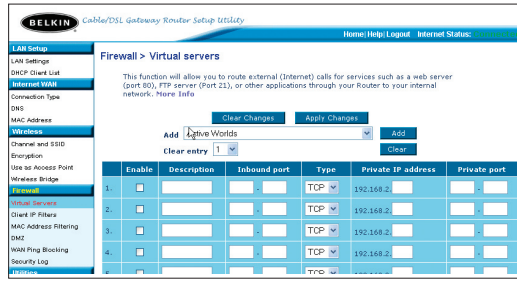
- IP Spoofing
- SYN flood
- Land Attack
- UDP flooding
- Ping of Death (PoD)
- Tear Drop Attack
- Denial of Service (DoS)
- ICMP defect
- IP with zero length
- RIP defect
- Smurf Attack
- Fragment flooding
- TCP Null Scan



The firewall also masks common ports that are frequently used to attack networks. These ports appear to be “Stealth”, meaning that for all intents and purposes, they do not exist to a would-be hacker. You can turn the firewall function off if needed, however, it is recommended that you leave the firewall enabled. Disabling the firewall protection will not leave your network completely vulnerable to hacker attacks, but it is recommended that you leave the firewall enabled.

Configuring Internal Forwarding Settings

The Virtual Servers function will allow you to route external (Internet) calls for services such as a web server (port 80), FTP server (Port 21), or other applications through your Router to your internal network. Since your internal computers are protected by a firewall, computers outside your network (over the Internet) cannot get to them because they cannot be “seen.” A list of common applications has been provided in case you need to configure the Virtual Server function for a specific application. If your application is not listed, you will need to contact the application vendor to find out which port settings you need.



Choosing an Application

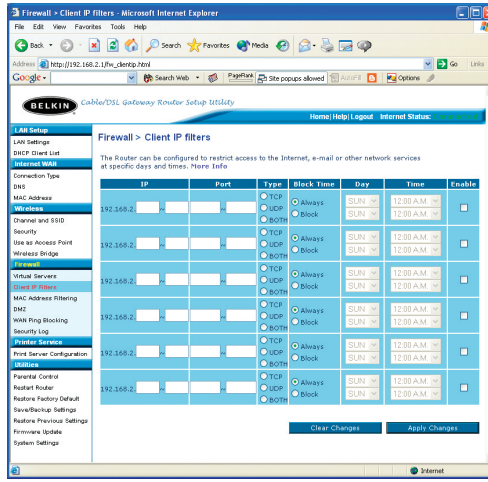
Select your application from the drop-down list. Click “Add”. The settings will be transferred to the next available space in the screen. Click “Apply Changes” to save the setting for that application. To remove an application, select the number of the row that you want to remove then click “Clear”.

Manually Entering Settings into the Virtual Server

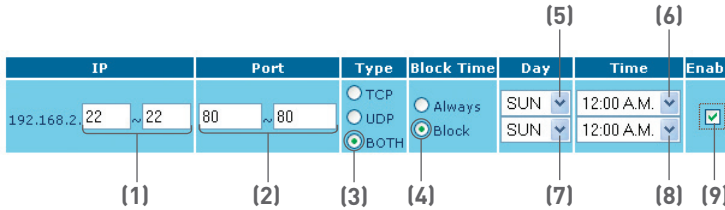
To manually enter settings, enter the IP address in the space provided for the internal (server) machine, the port(s) required to pass, select the port type (TCP or UDP), and click “Apply Changes”. Each inbound port entry has two fields with 5 characters maximum per field that allows a start and end port range, e.g. [xxxxx]-[xxxxx]. For each entry, you can enter a single port value by filling in the two fields with the same value (e.g. [7500]-[7500] or a wide range of ports (e.g. [7500]-[9000]). If you need multiple single port value or mixture of ranges and a single value, you must use multiple entries up to the maximum of 20 entries (e.g. 1. [7500]-[7500], 2. [8023]-[8023], 3. [9000]-[9000]). You can only pass one port per internal IP address. Opening ports in your firewall can pose a security risk. You can enable and disable settings very quickly. It is recommended that you disable the settings when you are not using a specific application.

Setting Client IP Filters

The Router can be configured to restrict access to the Internet, e-mail, or other network services at specific days and times. Restriction can be set for a single computer, a range of computers, or multiple computers.

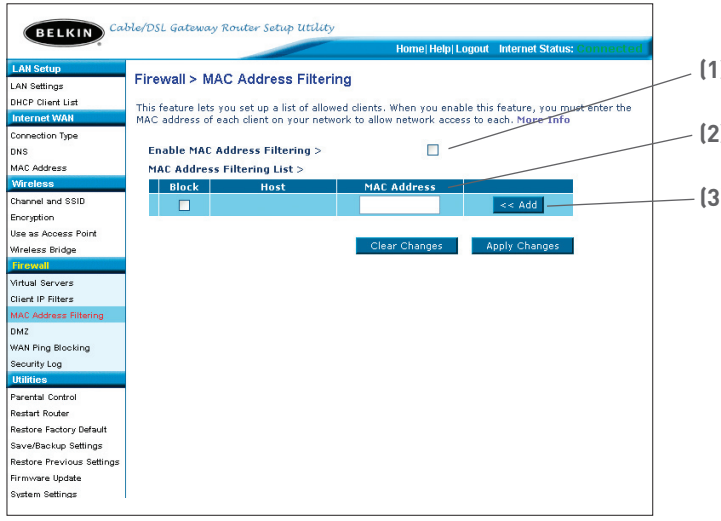


To restrict Internet access to a single computer for example, enter the IP address of the computer you wish to restrict access to in the IP fields **(1)**. Next, enter “80” in both the port fields **(2)**. Select “Both” **(3)**. Select “Block” **(4)**. You can also select “Always” to block access all of the time. Select the day to start on top **(5)**, the time to start on top **(6)**, the day to end on the bottom **(7)**, and the time to stop **(8)** on the bottom. Select “Enable” **(9)**. Click “Apply Changes”. The computer at the IP address you specified will now be blocked from Internet access at the times you specified. **Note:** Be sure you have selected the correct time zone under “Utilities> System Settings> Time Zone”.



Setting MAC Address Filtering

The MAC address filter is a powerful security feature that allows you to specify which computers are allowed on the network. Any computer attempting to access the network that is not specified in the filter list will be denied access. When you enable this feature, you must enter the MAC address of each client (computer) on your network to allow network access to each. The “Block” feature lets you turn on and off access to the network easily for any computer without having to add and remove the computer’s MAC address from the list.

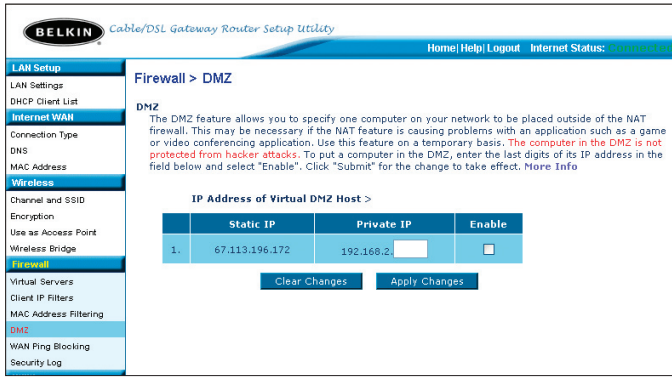


To enable this feature, select “Enable MAC Address Filtering” **(1)**. Next, enter the MAC address of each computer on your network by clicking in the space provided **(2)** and entering the MAC address of the computer you want to add to the list. Click “Add” **(3)**, then “Apply Changes” to save the settings. To delete a MAC address from the list, simply click “Delete” next to the MAC address you wish to delete. Click “Apply Changes” to save the settings.

Note: You will not be able to delete the MAC address of the computer you are using to access the Router’s administrative functions (the computer you are using now).

Enabling the Demilitarized Zone (DMZ)

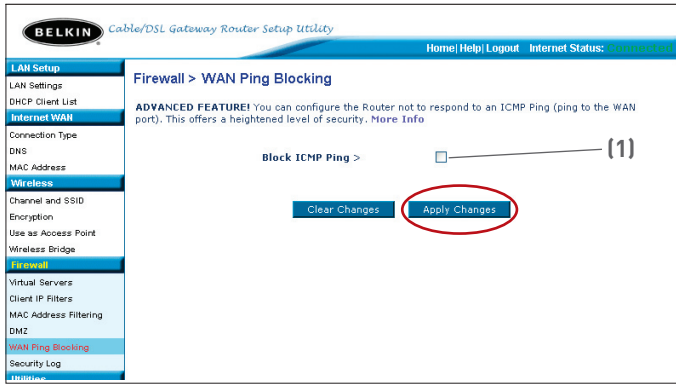
The DMZ feature allows you to specify one computer on your network to be placed outside of the firewall. This may be necessary if the firewall is causing problems with an application such as a game or video conferencing application. Use this feature on a temporary basis. The computer in the DMZ is NOT protected from hacker attacks.



To put a computer in the DMZ, enter the last digits of its IP address in the IP field and select “Enable”. Click “Apply Changes” for the change to take effect. If you are using multiple static WAN IP addresses, it is possible to select which WAN IP address the DMZ host will be directed to. Type in the WAN IP address you wish the DMZ host to direct to, enter the last two digits of the IP address of the DMZ host computer, select “Enable” and click “Apply Changes”.

Blocking an ICMP Ping

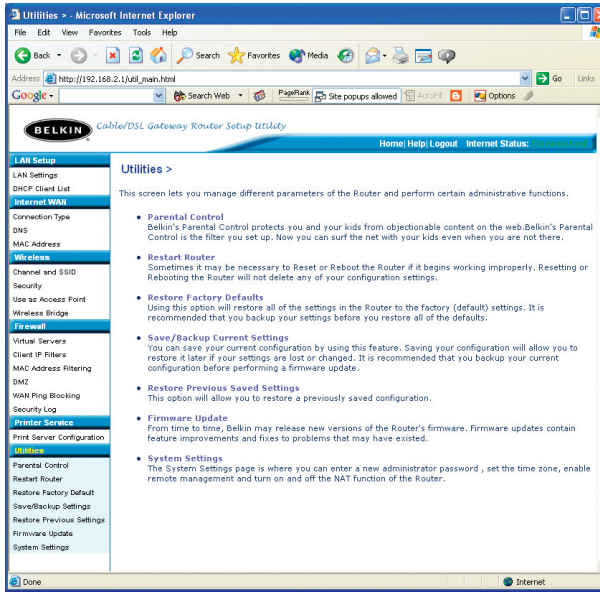
Computer hackers use what is known as “pinging” to find potential victims on the Internet. By pinging a specific IP address and receiving a response from the IP address, a hacker can determine that something of interest might be there. The Router can be set up so it will not respond to an ICMP ping from the outside. This heightens the level of security of your Router.



To turn off the ping response, select “Block ICMP Ping” **(1)** and click “Apply Changes”. The Router will not respond to an ICMP ping.

Utilities Tab

This screen lets you manage different parameters of the Router and perform certain administrative functions.



Parental Control

See separate Parental Control User Manual from Belkin.

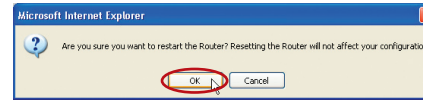
Restarting the Router

Sometimes it may be necessary to restart or reboot the Router if it begins working improperly. Restarting or rebooting the Router will NOT delete any of your configuration settings.

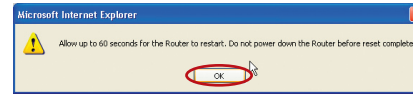
Restarting the Router to Restore Normal Operation

1. Click the “Restart Router” button.

2. The following message will appear. Click “OK”.



3. The following message will appear. Restarting the Router can take up to 60 seconds. It is important not to turn off the power to the Router during the restart.

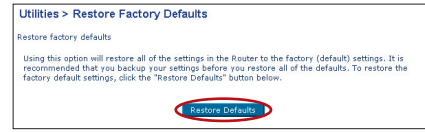


4. A 60-second countdown will appear on the screen. When the countdown reaches zero, the Router will be restarted. The Router home page should appear automatically. If not, type in the Router’s address (default = 192.168.2.1) into the navigation bar of your browser.

Restoring Factory Default Settings

Using this option will restore all of the settings in the Router to the factory (default) settings. It is recommended that you back up your settings before you restore all of the defaults.

1. Click the “Restore Defaults” button.



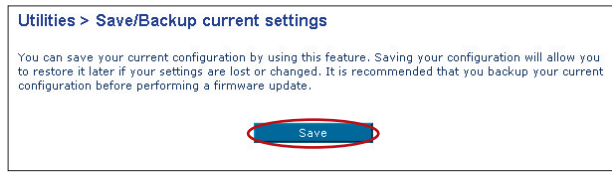
2. The following message will appear. Click “OK”.

3. The following message will appear. Restoring the defaults includes restarting the Router. It can take up to 60 seconds. It is important not to turn the power to the Router off during the restart.

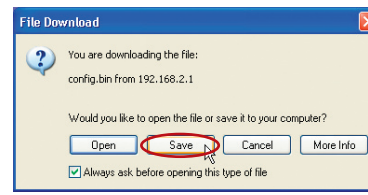
4. A 60-second countdown will appear on the screen. When the countdown reaches zero, the Router’s defaults will be restored. The Router home page should appear automatically. If it does not, type in the Router’s address (default = 192.168.2.1) into the navigation bar of your browser.

Saving a Current Configuration

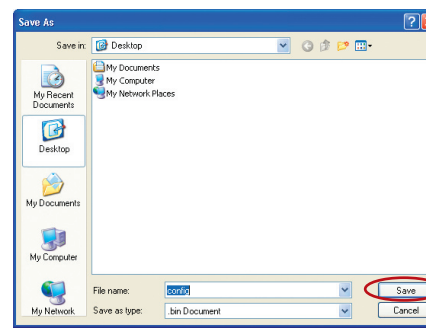
You can save your current configuration by using this feature. Saving your configuration will allow you to restore it later if your settings are lost or changed. It is recommended that you back up your current configuration before performing a firmware update.



1. Click “Save”. A window called “File Download” will open. Click “Save”.

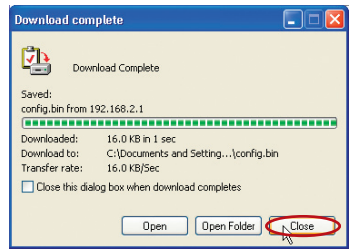


2. A window will open that allows you to select the location where you want to save the configuration file. Select a location. You can name the file anything you want, or use the default name “Config”. Be sure to name the file so you can locate it yourself later. When you have selected the location and name of the file, click “Save”.



3. When the save is complete, you will see the following window. Click “Close”.

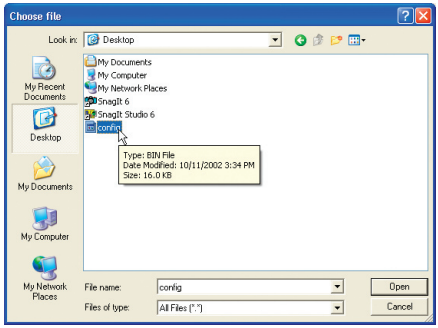
The configuration is now saved.



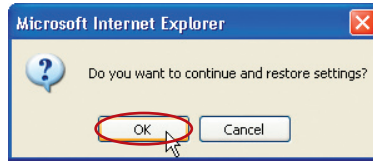
Restoring a Previous Configuration

This option will allow you to restore a previously saved configuration.

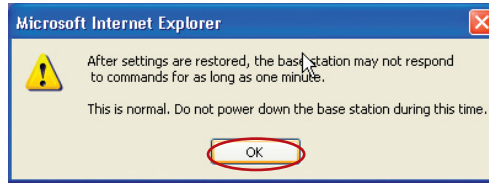
1. Click “Browse”. A window will open that allows you to select the location of the configuration file. All configuration files end with a “.bin”. Locate the configuration file you want to restore and double-click on it.



2. You will be asked if you want to continue. Click “OK”.



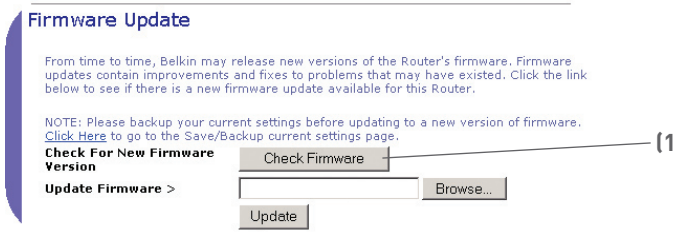
3. A reminder window will appear. It will take up to 60 seconds for the configuration restoration to complete. Click “OK”.



4. A 60-second countdown will appear on the screen. When the countdown reaches zero, the Router’s configuration will be restored. The Router home page should appear automatically. If not, type in the Router’s address (default = 192.168.2.1) into the navigation bar of your browser.

Updating the Firmware

From time to time, Belkin may release new versions of the Router's firmware. Firmware updates contain feature improvements and fixes to problems that may exist. When Belkin releases new firmware, you can download the firmware from the Belkin update website and update your Router's firmware to the latest version.

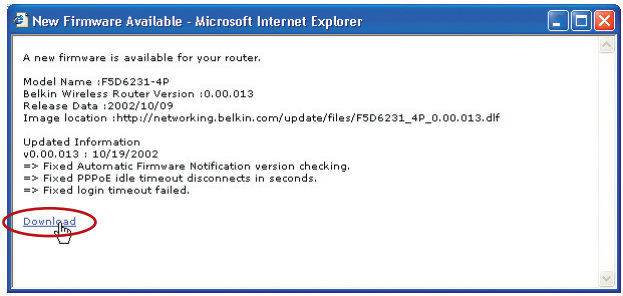


Checking for a New Version of Firmware

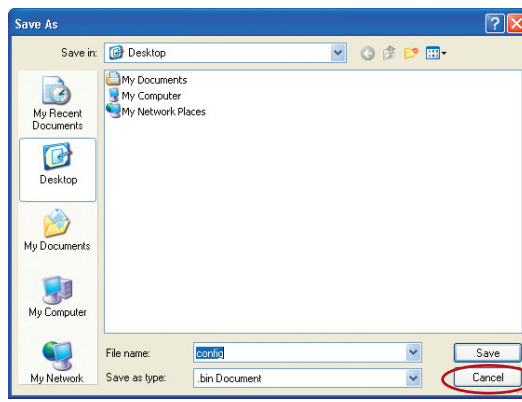
The "Check Firmware" **(1)** button allows you to instantly check for a new version of firmware. When you click the button, a new browser window will appear informing you that either no new firmware is available or that there is a new version available. If a new version is available, you will have the option to download it.

Downloading a New Version of Firmware

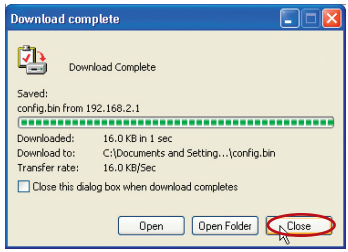
If you click the “Check Firmware” button and a new version of firmware is available, you will see a screen such as the following.



1. To download the new version of firmware, click “Download”.
2. A window will open that allows you to select the location where you want to save the firmware file. Select a location. You can name the file anything you want, or use the default name. Be sure to save the file in a place where you can locate it yourself later. **Note:** We suggest saving this to your desktop to locate the file easily. When you have selected the location, click “Save”.



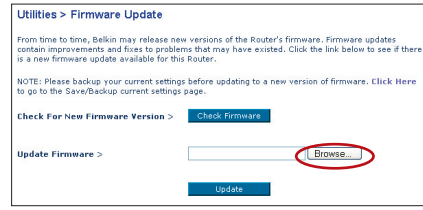
3. When the save is complete, you will see the following window. Click “Close”.



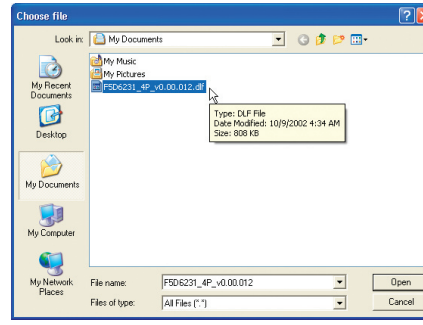
The download of the firmware is complete. To update the firmware, follow the next steps in “Updating the Router’s Firmware”.

Updating the Router’s Firmware

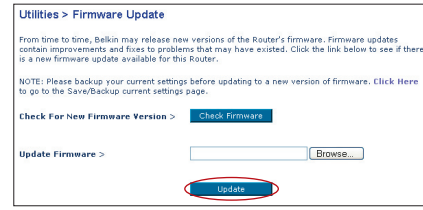
1. In the “Firmware Update” page, click “Browse”. A window will open that allows you to select the location of the firmware update file. All firmware files end with a “.dlf”.



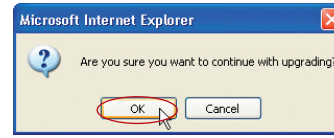
2. Browse to the firmware file you downloaded. Select the file by double-clicking on the file name.



3. The “Update Firmware” box will now display the location and name of the firmware file you just selected. Click “Update”.



4. You will be asked if you are sure you want to continue. Click “OK”.



5. You will see one more message. This message tells you that the Router may not respond for as long as one minute as the firmware is loaded into the Router and the Router is rebooted. Click “OK”.

6. A 60-second countdown will appear on the screen. When the countdown reaches zero, the Router firmware update will be complete. The Router home page should appear automatically. If not, type in the Router’s address (default = 192.168.2.1) into the navigation bar of your browser.

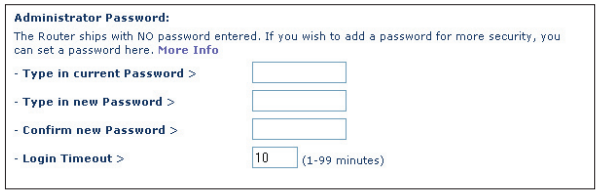
The firmware update is complete!

Changing System Settings

The “System Settings” page is where you can enter a new administrator password, set the time zone, enable remote management, and turn on and off the NAT function of the Router.

Setting or Changing the Administrator Password

The Router ships with NO password entered. If you wish to add a password for greater security, you can set a password here. Write down your password and keep it in a safe place, as you will need it if you need to log into the Router in the future. It is also recommended that you set a password if you plan to use the remote management feature of your Router.



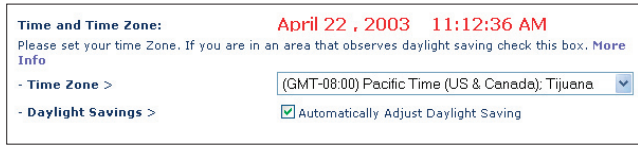
Changing the Login Timeout Setting

The login timeout option allows you to set the period of time that you can be logged into the Router’s advanced setup interface. The timer starts when there has been no activity. For example, you have made some changes in the advanced setup interface, then left your computer alone without clicking “Logout”. Assuming the timeout is set to 10 minutes, then 10 minutes after you leave, the login session will expire. You will have to login to the Router again to make any more changes. The login timeout option is for security purposes and the default is set to 10 minutes.

Note: Only one computer can be logged into the Router’s advanced setup interface at one time.

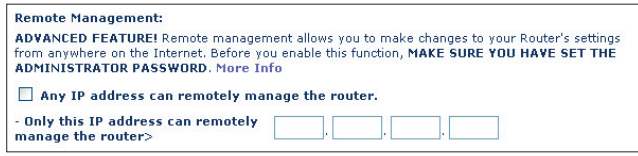
Setting the Time and Time Zone

The Router keeps time by connecting to a Simple Network Time Protocol (SNTP) server. This allows the Router to synchronize the system clock to the global Internet. The synchronized clock in the Router is used to record the security log and control client filtering. Select the time zone that you reside in. If you reside in an area that observes Daylight Saving, then place a check mark in the box next to “Enable Daylight Saving”. The system clock may not update immediately. Allow at least 15 minutes for the Router to contact the time servers on the Internet and get a response. You cannot set the clock yourself.



Enabling Remote Management

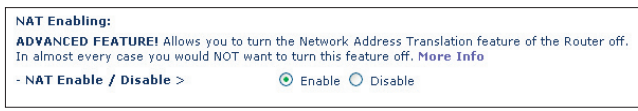
Before you enable this advanced feature of your Belkin Router, **MAKE SURE YOU HAVE SET THE ADMINISTRATOR PASSWORD**. Remote management allows you to make changes to your Router’s settings from anywhere on the Internet. There are two methods of remotely managing the Router. The first is to allow access to the Router from anywhere on the Internet by selecting “Any IP address can remotely manage the Router”. By typing in your WAN IP address from any computer on the Internet, you will be presented with a login screen where you need to type in the password of your Router. The second method is to allow a specific IP address only to remotely manage the Router. This is more secure, but less convenient. To use this method, enter the IP address you know you will be accessing the Router from in the space provided and select “Only this IP address can remotely manage the Router”. Before you enable this function, it is STRONGLY RECOMMENDED that you set your administrator password. Leaving the password empty will potentially open your Router to intrusion.



Enabling/Disabling NAT (Network Address Translation)

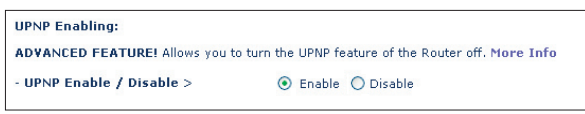
Note: This advanced feature should be employed by advanced users only.

Before enabling this function, **MAKE SURE YOU HAVE SET THE ADMINISTRATOR PASSWORD**. Network Address Translation (NAT) is the method by which the Router shares the single IP address assigned by your ISP with the other computers on your network. This function should only be used if your ISP assigns you multiple IP addresses or you need NAT disabled for an advanced system configuration. If you have a single IP address and you turn NAT off, the computers on your network will not be able to access the Internet. Other problems may also occur. Turning off NAT will disable your firewall functions.



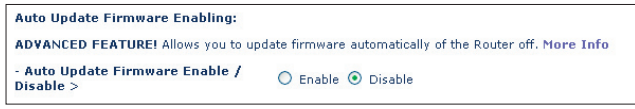
Enabling/Disabling UPnP

UPnP (Universal Plug-and-Play) is yet another advanced feature offered by your Belkin Router. It is a technology that offers seamless operation of voice messaging, video messaging, games, and other applications that are UPnP-compliant. Some applications require the Router's firewall to be configured in a specific way to operate properly. This usually requires opening TCP and UDP ports, and in some instances, setting trigger ports. An application that is UPnP-compliant has the ability to communicate with the Router, basically "telling" the Router which way it needs the firewall configured. The Router ships with the UPnP feature disabled. If you are using any applications that are UPnP-compliant, and wish to take advantage of the UPnP features, you can enable the UPnP feature. Simply select "Enable" in the "UPnP Enabling" section of the "Utilities" page. Click "Apply Changes" to save the change.



Enabling/Disabling Auto Firmware Update

This innovation provides the Router with the built-in capability to automatically check for a new version of firmware and alert you that the new firmware is available. When you log into the Router's advanced interface, the Router will perform a check to see if new firmware is available. If so, you will be notified. You can choose to download the new version or ignore it. The Router ships with this feature enabled. If you want to disable it, select "Disable" and click "Apply Changes".

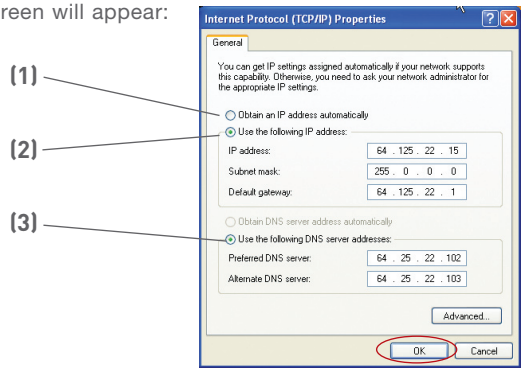


Manually Configuring Computer Network Settings

In order for your computer to properly communicate with your Router, you will need to change your PC's TCP/IP settings to DHCP.

Manually Configuring Network Adapters in Windows 2000, NT, or XP

1. Click "Start", "Settings", then "Control Panel".
2. Double-click on the "Network and dial-up connections" icon (Windows 2000) or the "Network" icon (Windows XP).
3. Right-click on the "Local Area Connection" associated with your network adapter and select "Properties" from the drop-down menu.
4. In the "Local Area Connection Properties" window, click "Internet Protocol (TCP/IP)" and click the "Properties" button. The following screen will appear:



5. If "Use the following IP address" **(2)** is selected, your Router will need to be set up for a static IP connection type. Write the address information the table below. You will need to enter this information into the Router.

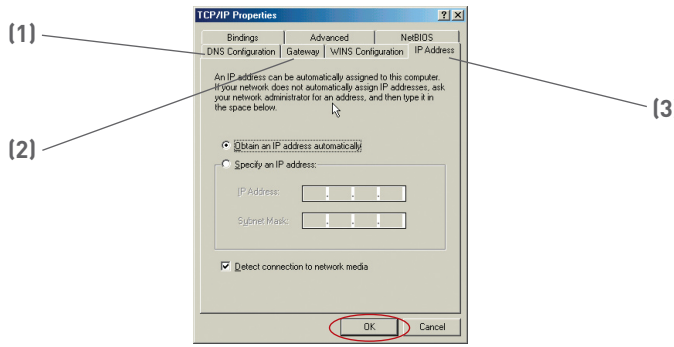
IP address:	
Subnet Mask:	
Default gateway:	
Preferred DNS server:	
Alternate DNS server:	

6. If not already selected, select "Obtain an IP address automatically" **(1)** and "Obtain DNS server address automatically" **(3)**. Click "OK".

Your network adapter(s) are now configured for use with the Router.

Manually Configuring Network Adapters in Windows 98SE or Me

1. Right-click on “My Network Neighborhood” and select “Properties” from the drop-down menu.
2. Select “TCP/IP -> settings” for your installed network adapter. You will see the following window.



3. If “Specify and IP address” is selected, your Router will need to be set up for a static IP connection type. Write the address information in the table below. You will need to enter this information into the Router.

IP address:	
Subnet Mask:	
Default gateway:	
Preferred DNS server:	
Alternate DNS server:	

4. Write the IP address and subnet mask from the “IP Address” tab **(3)**.
5. Click the “Gateway” tab **(2)**. Write the gateway address down in the chart.
6. Click the “DNS Configuration” tab **(1)**. Write the DNS address(es) in the chart.
7. If not already selected, select “Obtain IP address automatically” on the IP address tab. Click “OK”.

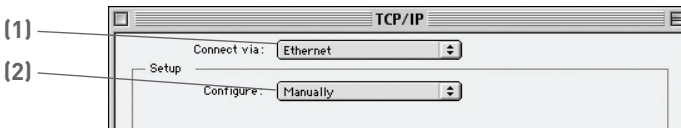
Restart the computer. When the computer restarts, your network adapter(s) are now configured for use with the Router.

Set up the computer that is connected to the cable or DSL modem FIRST using these steps. You can also use these steps to add computers to your Router after the Router has been set up to connect to the Internet.

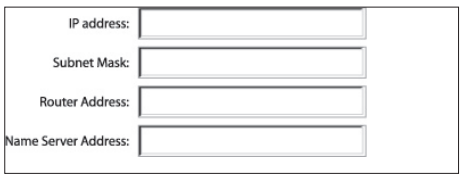
Manually Configuring Network Adapters in Mac OS® up to 9.x

In order for your computer to properly communicate with your Router, you will need to change your Mac's TCP/IP settings to DHCP.

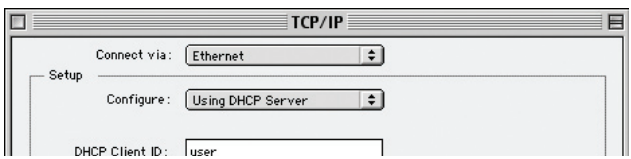
1. Pull down the Apple menu. Select "Control Panels" and select "TCP/IP".
2. You will see the TCP/IP control panel. Select "Ethernet Built-In" or "Ethernet" in the "Connect via:" drop-down menu **(1)**.



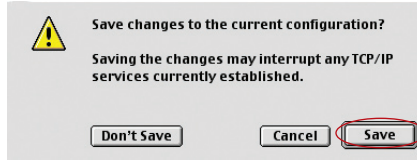
3. Next to "Configure" **(2)**, if "Manually" is selected, your Router will need to be set up for a static IP connection type. Write the address information in the table below. You will need to enter this information into the Router.



4. If not already set, at "Configure:", choose "Using DHCP Server". This will tell the computer to obtain an IP address from the Router.



5. Close the window. If you made any changes, the following window will appear. Click “Save”.

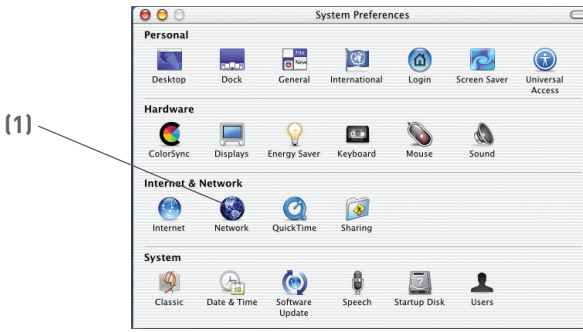


Restart the computer. When the computer restarts, your network settings are now configured for use with the Router.

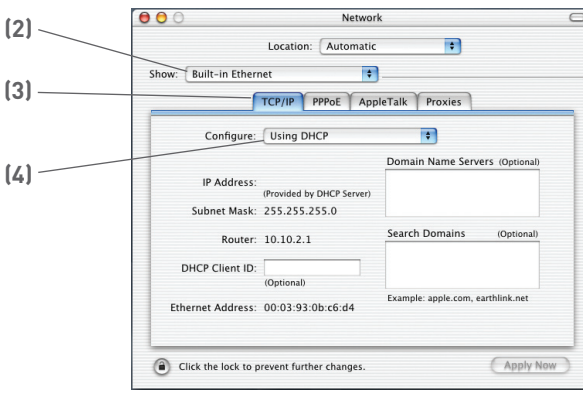
Manually Configuring Network Adapters in Mac OS X

1. Click on the “System Preferences” icon.

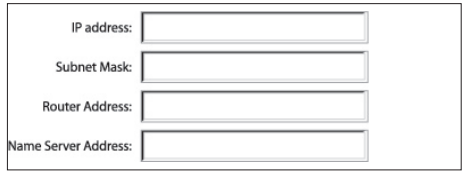
2. Select “Network” **(1)** from the “System Preferences” menu.



3. Select “Built-in Ethernet” **(2)** next to “Show” in the Network menu.



4. Select the “TCP/IP” tab **(3)**. Next to “Configure” **(4)**, you should see “Manually” or “Using DHCP”. If you do not, check the PPPoE tab **(5)** to make sure that “Connect using PPPoE” is NOT selected. If it is, you will need to configure your Router for a PPPoE connection type using your user name and password.
5. If “Manually” is selected, your Router will need to be set up for a static IP connection type. Write the address information in the table below. You will need to enter this information into the Router.



6. If not already selected, select “Using DHCP” next to “Configure” **(4)**, then click “Apply Now”.

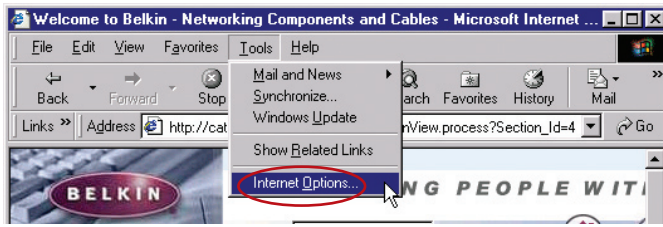
Your network adapter(s) are now configured for use with the Router.

Recommended Web Browser Settings

In most cases, you will not need to make any changes to your web browser's settings. If you are having trouble accessing the Internet or the advanced web-based user interface, then change your browser's settings to the recommended settings in this section.

Internet Explorer 4.0 or Higher

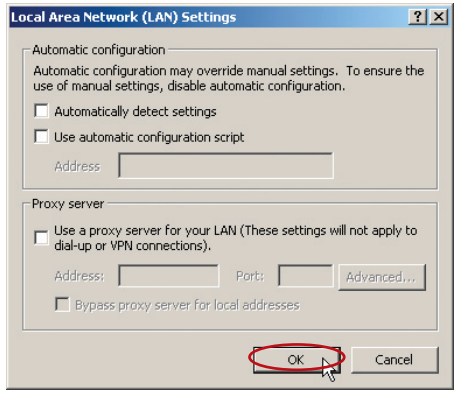
1. Start your web browser. Select "Tools" then "Internet Options".



2. In the "Internet Options" screen, there are three selections: "Never dial a connection", "Dial whenever a network connection is not present", and "Always dial my default connection". If you can make a selection, select "Never dial a connection". If you cannot make a selection, go to the next step.

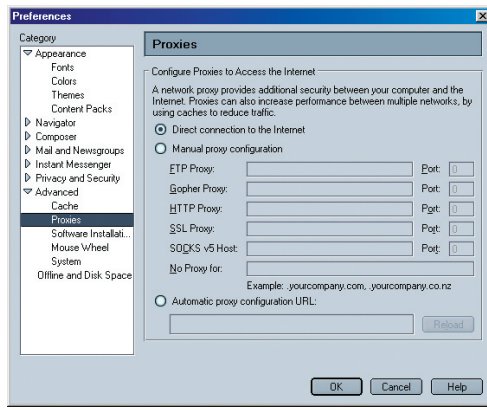
3. Under the "Internet Options" screen, click on "Connections" and select "LAN Settings...".

4. Make sure there are no check marks next to any of the displayed options: “Automatically detect settings”, “Use automatic configuration script”, and “Use a proxy server”. Click “OK”. Then click “OK” again in the “Internet Options” page.



Netscape Navigator 4.0 or Higher

1. Start Netscape. Click on “Edit” then “Preferences”.
2. In the “Preferences” window, click on “Advanced” then select “Proxies”. In the “Proxies” window, select “Direct connection to the Internet”.



Using your Router with AOL Broadband

How to set up your network to operate with AOL® for Broadband and your new Belkin Router

There are two types of AOL connections available—either AOL DSL or AOL Cable. A third service is called AOL BYOA (Bring Your Own Access). This is used along with an existing broadband connection, supplied by your Internet Service Provider (ISP). If you have AOL DSL, please refer to "Directions for AOL DSL Users" below for setup instructions. If you have either AOL Cable or the AOL BYOA service, please go to the "Directions for AOL Cable Users" section of this guide, on page 104.

Directions for AOL DSL Users

STEP 1: Create AOL screen names for the Router and for each computer that will be using your AOL service.

STEP 2: Configure the Router for AOL for Broadband.

STEP 3: Configure your computers with the new AOL screen names you just created.

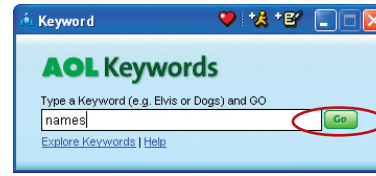
Step 1 | Creating new AOL screen names

Note: Your AOL connections must be set to operate on the TCP/IP standard. If you have designated another protocol, reset them to TCP/IP before proceeding.

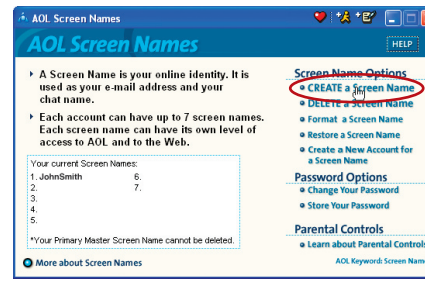
1. If your Router is currently connected to the network, remove it from the network and connect it directly to your broadband modem. Then, log on to AOL as you normally do.
2. Log on to your AOL master account.

3. Perform a keyword search on “names” by clicking “Keyword”, and then “Go to Keyword”.

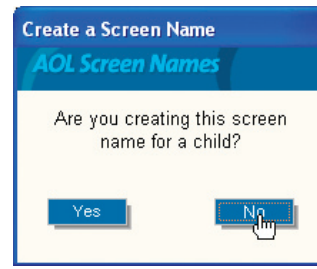
4. In the “Keyword” window, type in “names” then click “Go”.



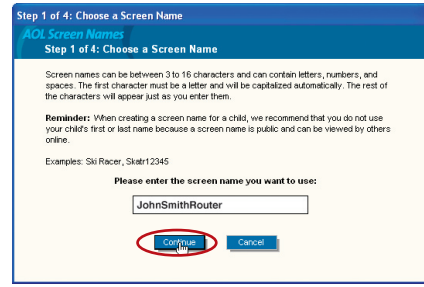
5. You will see the “AOL Screen Names” window. Click “CREATE a Screen Name”.



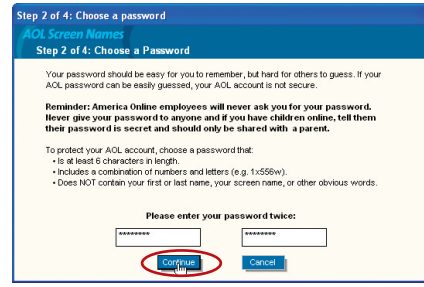
6. A window will appear that asks whether the screen name is for a child. If you are creating the screen name for the Router, click “Yes” or “No” (it doesn’t matter which you select). If you are creating a screen name for an additional computer, select the appropriate answer.



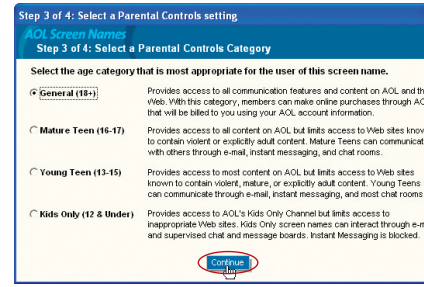
7. The “Choose a Screen Name” window will appear. Type in a screen name, and click “Continue”. If this screen name is for the Router, the name you choose should be something like your master screen name followed by the word Router. For instance “JohnSmithRouter”. If the screen name is for a computer, type in the screen name of the computer for which you are creating this screen name. Click “Continue”.



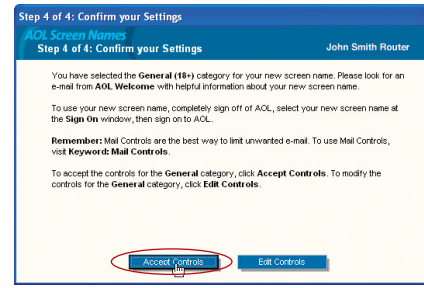
8. The “Choose a password” screen will appear. Enter the password for this screen name twice, and click “Continue”.



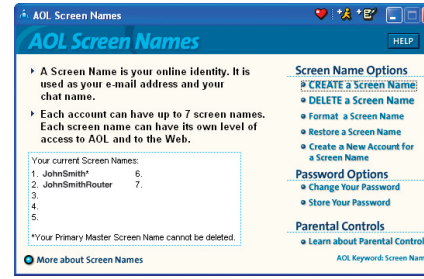
9. The “Select a Parental Controls setting” window will appear. If this screen name is for the Router, choose any one of the settings (it doesn’t matter which). If this screen name is for a computer, choose the desired setting and click “Continue”.



10. The “Confirm your Settings” window will appear. Select “Accept Controls”.



11. The “AOL Screen Names” window appears. This window will include all the screen names you have created to this point.

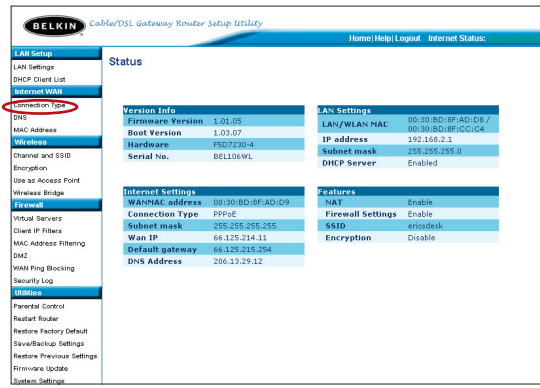


12. Repeat steps 1-11 to add an additional screen name for each computer that will be using AOL and that will be connected to the Router. When you are finished adding screen names, go to Step 2.

Step 2 | Configuring the Router

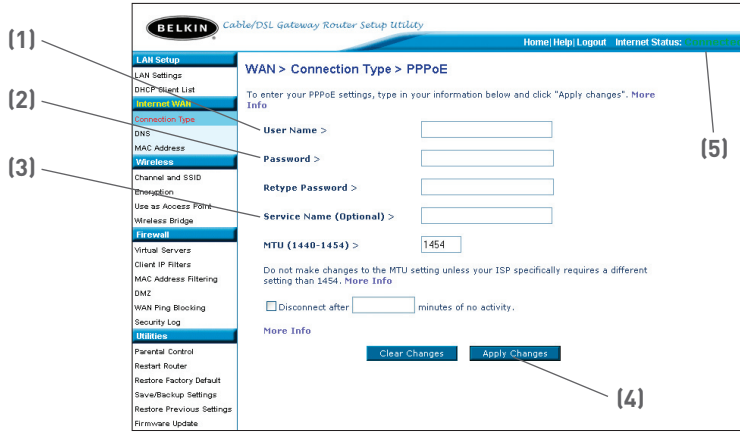
Follow this step only if you use AOL DSL. This procedure is for Belkin Router models F5D5231-4, F5D6231-4, F5D7230-4, and F5D7231-4.

1. Connect your Router to your network per the instructions in your User Manual.
2. Open your Web browser.
3. In the address bar of your browser, type http://192.168.2.1 and click “Go”. You will be directed to the Router’s home page. Click on “Connection Type” in the left-hand column under “Internet WAN” heading.



4. You will see the Router’s login page. Leave the password field blank and click “Submit”.
5. You will now see the “Connection Type” page. Select “PPPoE” and click “Next”. You will now see the PPPoE setup page.
6. In the “User Name” field, type in the screen name that you created for your Router **(1)**.

7. In the password fields, type in the password you created for the Router's screen name **(2)**.

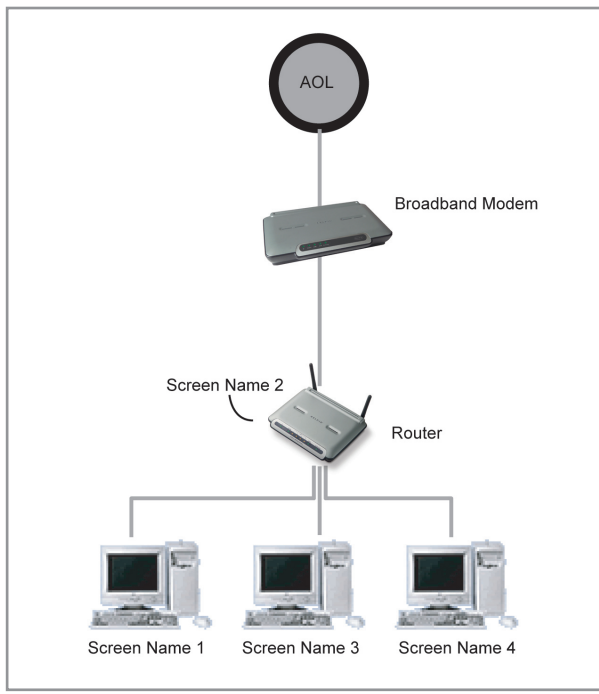


8. Leave the "Service Name" field blank **(3)**. Do not change the MTU setting.
9. Click on "Apply Changes" **(4)**.
10. Click on the Home link at the top of the screen. The Internet Status indicator should read "Connected" **(5)**.
11. Go to Step 3.

Step 3 | **Configure your computers with the AOL screen names you just created**

This step consists of installing the AOL software on each computer and configuring it to use one of the screen names you created in Step 1. Remember that each computer MUST use a different screen name. For help installing and configuring the AOL software, contact AOL's technical support department.

Network Configuration



AOL Cable or AOL BYOA (Bring Your Own Access) Users Directions

AOL Cable users need to follow these directions. If you have AOL DSL, go to the "Directions for AOL DSL" section beginning on page 97.

AOL Cable Users STEP 1:
Create AOL screen names for each computer that will be using your AOL service.

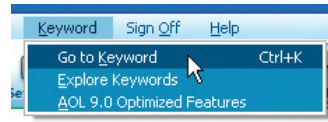
AOL DSL Users STEP 2:
Configure your computers with the new AOL screen names you just created.

AOL Cable or AOL BYOA Users

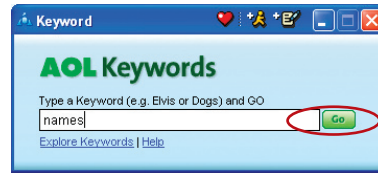
Step 1 | Creating new AOL screen names

Note: Your AOL connections must be set to operate on the TCP/IP standard. If you have designated another protocol, reset them to TCP/IP before proceeding.

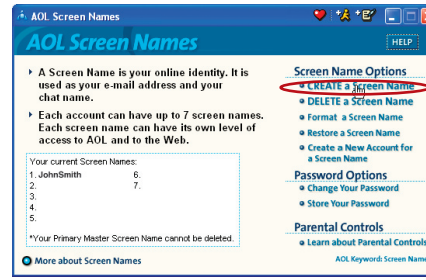
1. Connect the Router to the network per the instructions in your User Manual. Once the Router is installed properly, go to the next step.
2. Log on to your AOL master account.
3. Perform a keyword search on "names" by clicking "Keyword", and then "Go to Keyword".



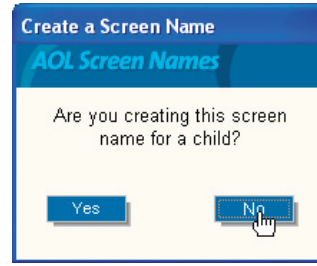
4. In the "Keyword" window, type in "names" then click "Go".



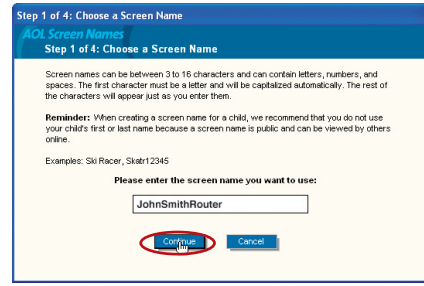
5. You should see the "AOL Screen Names" window. Click "CREATE a Screen Name".



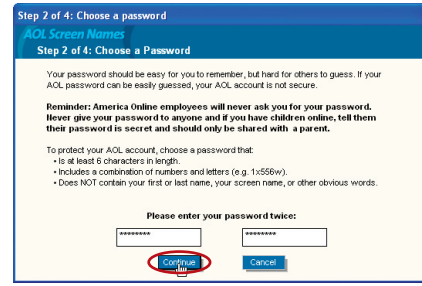
6. A window will appear that asks whether the screen name is for a child. Click "Yes" or "No" to answer.



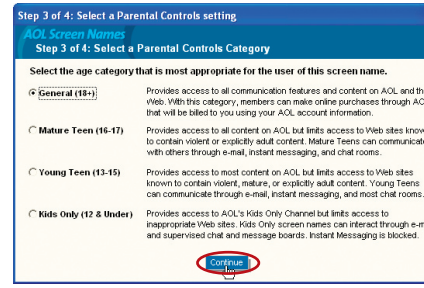
7. The "Choose a Screen Name" window will appear. Type in the screen name of the computer for which you are creating this screen name. Click "Continue".



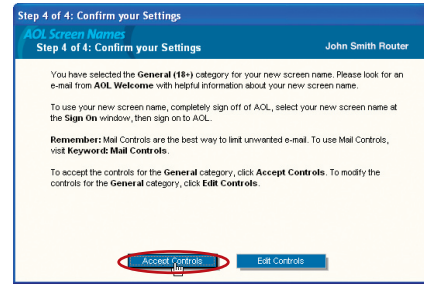
8. The “Choose a password” screen will appear. Enter the password for this screen name twice, and click “Continue”.



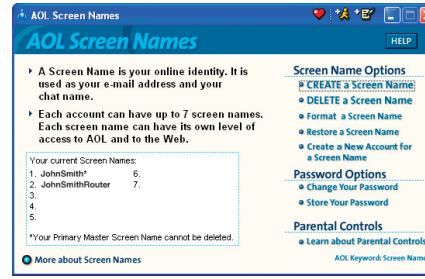
9. The “Select a Parental Controls setting” window will appear. Choose the appropriate setting for this screen name. Click “Continue”.



10. The “Confirm your Settings” window will appear. Select “Accept Controls”.



11. The “AOL Screen Names” window appears. This window will include all the accounts you have created to this point.

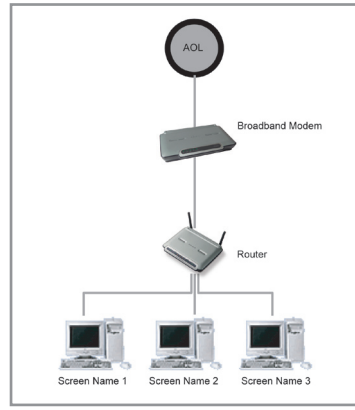


12. Repeat steps 1-11 for each computer that will be using AOL and that will be connected to your Belkin Router. When you are finished adding screen names, go to Step 2.

Step 2 | Configure your computers with the new AOL screen names you just created

This step consists of installing the AOL software on each computer and configuring it to use one of the screen names you created in Step 1. Remember that each computer MUST use a different screen name. For help installing and configuring the AOL software, contact AOL’s technical support department.

Network Configuration



Problem:

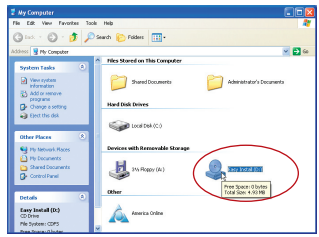
Installation CD does not automatically start

Solution:

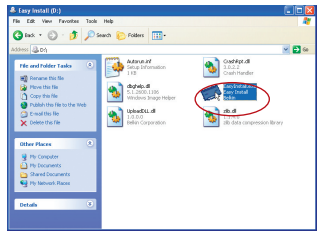
If the CD-ROM does not start the Easy Install Wizard automatically, it could be that the computer is running other applications that are interfering with the CD drive.

1. If the Easy Install Wizard screen does not appear within 15-20 seconds, open up your CD-ROM drive by double clicking on the "My Computer" icon that is located on your desktop.

2. Next, double-click on the CD-ROM drive that the Easy Installation CD has been placed in to start the installation.



3. Easy Install should start within a few seconds If, instead, a window appears showing the files on the CD, double-click on the icon labeled "EasyInstall.exe".



4. If the Easy Install Wizard is still does not start, reference the section titled "Manually Configuring Network Settings" (page 89 of this manual for alternative setup method).

Problem:

Easy Install cannot find my Router

Solution:

If the Easy Install Wizard is not able to find the Router during the installation process please check the following items:

1. If the Easy Install Wizard is not able to find the Router during the installation process, there may be 3rd party firewall software installed on the computer attempting to access the Internet. Examples of third party firewall software are ZoneAlarm, BlackICE PC Protection, McAfee Personal Firewall, and Norton Personal Firewall.

   If you do have firewall software installed on your computer, please make sure that you properly configure it. You can determine if the firewall software is preventing Internet access by temporarily turning it off. If, while the firewall is disabled, Internet access works properly, you will need to change the firewall settings to function properly when it is turned on.

   Please refer to the instructions provided by the publisher of your firewall software for instructions on configuring the firewall to allow Internet access.

2. Unplug power to the Router for 10 seconds, and then plug the power back into the router. Ensure that the router's Power light is on; it should be solid green. If not, check to make sure that the AC adapter is connected to the router and plugged into a wall outlet.

3. Ensure that you have a cable (use the cable included with the router) connected between (1) the network (Ethernet) port on the back of the computer and (2) one of the LAN ports, labeled "1" through "4", on the back of the router.

   Note: the computer should NOT be connected to the port labeled "Internet/WAN" on the back of the router.

4. Try shutting down and restarting your computer, then re-running the Easy Install.

   If the Easy Install Wizard is still unable to find the Router, reference the section titled "Manually Configuring Network Settings" for installation steps.

Problem:

Easy Install cannot connect my Router to the Internet

Solution:

If the Easy Install Wizard is not able to connect the Router to the Internet, please check the following items:

1. Use the troubleshooting suggestions within the Easy Install Wizard. If the troubleshooting screen does not open automatically, click on the "Troubleshoot" button in the lower right-hand corner of the Easy Install Wizard window.

2. If your ISP requires a user name and password, make sure that you have typed in your user name and password correctly. Some user names require that the ISP's domain may be at the end of the name. Example: "myname@myisp.com". The "@myisp.com" part of the user name may need to be typed as well as your user name.

   If you continue to have no Internet connection, reference the section titled "Manually Configuring Network Settings" (page 89 of this manual for alternative setup method).

Problem:

- The Easy Install Wizard completed installation, but my web browser doesn't work
- I am unable to connect to the Internet. The Routers "WAN" light on my Router is off, and the "Connected" light is blinking

Solution:

If you cannot connect to the Internet, and the "WAN" light is off, and the "Connected" light is blinking, the problem may be that your modem and router are not connected properly.

1. Make sure the network cable between the modem and the Router is connected. We strongly recommend using the cable that was supplied with your Cable or DSL modem for this purpose. The cable should be connected at one end to the Router's "Internet/WAN" port, and at the other end to the network port on your modem.

2. Unplug the Cable or DSL modem from its power source for 3 minutes. After 3 minutes plug the modem back into its power source. This may force the modem to properly recognize the router.
3. Unplug the power to your Router, wait 10 seconds, and then reconnect the power. This will cause the router to re-attempt communication with the modem.

   If the "WAN" light on the Router is not lit after completing these steps, please contact Belkin Technical Support.
4. Try shutting down and restarting your computer.

Problem:

- The Easy Install Wizard completed installation, but my web browser doesn't work
- I am unable to connect to the Internet. The Routers "WAN" light on my Router is on, and the "Connected" light is blinking

Solution:

If you cannot connect to the Internet, the "WAN" light is on, and the "Connected" light is blinking, the problem may be that your connection type may not match the ISP's connection.

- If you have a "static IP address" connection, your ISP must assign you the IP address, subnet mask, and gateway address. Please refer to the section entitled "Alternate Setup Method" for details on changing this setting.

- If you have a "PPPoE" connection, your ISP will assign you a user name and password and sometimes a service name. Make sure the Router connection type is configured to PPPoE and the settings are entered properly. Please refer to your Router's User Guide section entitled "Alternate Setup Method" for details on changing this setting.

- You may need to configure your Router to meet the specific requirements of your ISP. To search our Knowledge Base for ISP-specific issues, go to: http://web.belkin.com/support and type in “ISP”

If you are still unable to access the Internet after verifying these settings, please contact Belkin Technical Support.

Problem:

- The Easy Install Wizard completed, but my web browser doesn’t work
- I am unable to connect to the Internet. The “WAN” light on my router is blinking, and the “Connected” light is solid

Solution:

If the “WAN” light is blinking, and the “Connected” light is solid, but you are unable to access the Internet, there may be 3rd party firewall software installed on the computer attempting to access the Internet. Examples of third party firewall software are ZoneAlarm, BlackICE PC Protection, McAfee Personal Firewall, and Norton Personal Firewall.

If you do have firewall software installed on your computer, please make sure that you properly configure it. You can determine if the firewall software is preventing Internet access by temporarily turning it off. If, while the firewall is disabled, Internet access works properly, you will need to change the firewall settings to function properly when it is turned on.

Please refer to the instructions provided by the publisher of your firewall software for instructions on configuring the firewall to allow Internet access.

If you are still unable to access the Internet after disabling any Firewall software, please contact Belkin Technical Support.

Problem:

I can't connect to the Internet wirelessly

Solution:

If you are unable to connect to the Internet from a wireless computer, please check the following items:

1. Look at the lights on your Router. If you're using a Belkin Router, the lights should be as follows:
   - The "Power" light should be on.
   - The "Connected" light should be on, and not blinking.
   - The "WAN" light should be either on or blinking.
2. Open your wireless utility software by clicking on the icon in the system tray at the bottom right-hand corner of the screen. If you're using a Belkin wireless card, the tray icon should look like this (the icon may be red or green):

3. The exact window that opens will vary depending on the model of wireless card you have; however, any of the utilities should have a list of "Available Networks" – those wireless networks it can connect to.

Does the name of your wireless network appear in the results?

Yes, my network name is listed – go to the troubleshooting solution titled " I can't connect to the Internet wirelessly, but my network name is listed"

No, my network name is not listed - go to the troubleshooting solution titled " I can't connect to the Internet wirelessly, and my network name is not listed"

Problem:

I can't connect to the Internet wirelessly, but my network name is listed

Solution:

If the name of your network is listed in the "Available Networks" list, please follow the steps below to connect wirelessly:

1. Click on the correct network name in the "Available Networks" list.
2. If the network has security (encryption) enabled, you will need to enter the network key. For more information regarding security, see the page entitled: Setting up wireless security
3. Within a few seconds, the tray icon in the lower left-hand corner of your screen should turn green, indication a successful connection to the network.

Problem:

I can't connect to the Internet wirelessly, and my network name is not listed

Solution

If the correct network name is not listed under "Available Networks" in the wireless utility, please attempt the following troubleshooting steps:

1. Temporarily move computer, if possible, five to ten feet from the Router. Close the wireless utility, and re-open it. If the correct network name now appears under "Available Networks", you may have a range or interference problem. Please see the suggestions discussed in the section titled "Placement of your Wireless Networking Hardware" of this user manual.

2. Using a computer that is connected to the Router via a network cable (as opposed to wirelessly), ensure that “Broadcast SSID” is enabled. This setting is found on the Router’s wireless “Channel and SSID” configuration page.

If you are still unable to access the Internet after completing these steps, please contact Belkin Technical Support.

Problem:

My wireless network performance is inconsistent

Data transfer is sometimes slow

Signal strength is poor

Difficulty establishing and/or maintaining a Virtual Private Network (VPN) connection

Solution:

Wireless Technology is radio-based, which means connectivity and the throughput performance between devices decreases when the distance between devices increases. Other factors that will cause signal degradation (metal is generally the worst culprit) are obstructions such as walls and metal appliances. As a result, the typical indoor range of your wireless devices will be between 100 to 200 feet. Note also that connection speed may decrease as you move further from the Router or Access Point.

In order to determine if wireless issues are related to range, we suggest temporarily moving the computer, if possible, five to ten feet from the router.

Changing the wireless channel - Depending on local wireless traffic and interference, switching the wireless channel of your network can improve performance and reliability. The default channel the router is shipped with is channel 11, you may choose from several other channels depending on your region; see page 47 - “changing the wireless channel” for instructions on how to choose other channels.

Limiting the wireless transmit rate - Limiting the wireless transmit rate can help improve the maximum wireless range, and connection stability. Most wireless cards have the ability to limit the transmission rate. To change this property, go to the Windows Control Panel, open the Network Connections and double-click on

your wireless card's connection. In the properties dialog, select the configure button on the General tab (Windows 98 users will have to select the wireless card in the list box and then click properties), then choose the advanced tab and select the Rate property. Wireless client cards are usually set to automatically adjust the wireless transmit rate for you, but doing so can cause periodic disconnects when the wireless signal is too weak; as a rule, slower transmission rates are more stable. Experiment with different connection rates until you find the best one for your environment; note that all available transmission rates should be acceptable for browsing the Internet. For more assistance, see your wireless card's user manual.

Problem:

How do I extend the range of my wireless network

Solution:

Belkin recommends using one of the following products to extend wireless network coverage throughout large homes or offices:

- Wireless Access Point: A wireless access point can effectively double the coverage area of your wireless network. An Access Point is typically placed in the area not currently covered by your wireless router, and connected to the router using either an Ethernet cable, or through your home's power lines using two Powerline Ethernet Adapters.
- For 802.11g (54g) wireless networks, Belkin offers a Wireless Range Extender/Access Point that can be connected wirelessly to a Belkin 802.11g Wireless Router, without requiring an Ethernet cable or Powerline Ethernet Adapters.

These Belkin products are available at your local retailer, or can be ordered from Belkin directly.

For network/range extension information, please visit: www.belkin.com/networking to find out more about:

802.11g Wireless Range Extender/Access Point (F5D7130)

Powerline Ethernet Adapter (F5D4070)

Powerline USB Adapter (F5D4050)

Problem:

I am having difficulty setting up Wired Equivalent Privacy (WEP) security on a Belkin Router or Belkin Access Point

Solution

1. Log into your Wireless Router or Access Point.

   Open your web browser and type in IP address of the Wireless Router or Access Point. (The Router default is 192.168.2.1, the 802.11g Access Point is 192.168.2.254). Log into your router by clicking on the “Login” button in the top right-hand corner of the screen. You will be asked to enter your password. If you never set a password, leave the password field blank and click “Submit”.

   Click the “Wireless” tab on the left of your screen. Select the “Encryption” or “Security” tab to get to the security settings page.

2. Select “128-bit WEP” from the drop-down menu.

3. After selecting your WEP encryption mode, you can type in your hex WEP key manually, or you can type in a passphrase in the “Passphrase” field and click “Generate” to create a WEP key from the passphrase. Click “Apply Changes” to finish. You must now set all of your clients to match these settings. A hex (hexadecimal) key is a mixture of numbers and letters from A-F and 0-9. For 128-bit WEP, you need to enter 26 hex keys.

   For example:

   C3030FAF4BB2C3D44BC3D4E7E4 = 128-bit key

4. Click “Apply Changes” to finish. Encryption in the Wireless Router is now set. Each of your computers on your wireless network will now need to be configured with the same security settings.

WARNING: If you are configuring the Wireless Router or Access Point from a computer with a wireless client, you will need to ensure that security is turned on for this wireless client. If this is not done, you will lose your wireless connection.

Note to Mac users: Original Apple Airport® products support 64-bit encryption only. Apple Airport 2 products can support 64-bit or 128-bit encryption. Please check your Apple Airport product to see which version you are using. If you cannot configure your network with 128-bit encryption, try 64-bit encryption.

Problem:

I am having difficulty setting up Wired Equivalent Privacy (WEP) security on a Belkin client card

Solution:

The client card must use the same key as the Wireless Router or Access Point. For instance, if your Wireless Router or Access Point uses the key 00112233445566778899AABBCC, then the client card must be set to the exact same key.

1. Double-click the Signal Indicator icon to bring up the Wireless Network screen. The Advanced button will allow you to view and configure more options of your card.
2. The “Advanced” button will allow you to view and configure more options of the card.
3. Once the advanced button is clicked the Belkin Wireless LAN Utility will appear. This Utility will allow you to manage all the advanced features of the Belkin wireless card.
4. Under the “Wireless Network Properties” tab, select a network name from the “Available networks” list and click the “Properties” button
5. Under “Data Encryption” select “WEP”
6. Ensure the check box “The key is provided for me automatically” at the bottom is unchecked. If you are using this computer to connect to a corporate network, please consult your network administrator if this box needs to be checked.
7. Type you WEP key in the “Network key’ box.

Important: A WEP key is a mixture of numbers and letters from A-F and 0-9. For 128-bit WEP, you need to enter 26 keys. This Network key needs to match the key you assign to your Wireless Router or Access Point.

For example:
C3030FAF4BB2C3D44BC3D4E7E4 = 128-bit key

8. Click “OK”, and then “Apply” to save the settings.

For non-Belkin wireless client cards please consult the manufacturer for that wireless client card’s user manual

Problem:

Do Belkin products support WPA?

Solution

Note: To use WPA security, all your clients must be upgraded to drivers and software that support it. At the time of this FAQ publication, a security patch download is available, for free, from Microsoft. This patch works only with the Windows XP operating system.

Download the patch here:

http://www.microsoft.com/downloads/details.aspx?FamilyID=009d8425-ce2b-47a4-abec-274845dc9e91&displaylang=en

You also need to download the latest driver for your Belkin Wireless 802.11g Desktop or Notebook Network Card from the Belkin support site. Other operating systems are not supported at this time. Microsoft’s patch only supports devices with WPA-enabled drivers such as Belkin 802.11g products

Download the latest driver at http://web.belkin.com/support for the following products:

F5D7000, F5D7001, F5D7010, F5D7011, F5D7230-4, F5D7231-4, F5D7130, F5D7231-4P, F5D7235-4

Problem:

I am having difficulty setting up Wi-Fi Protected Access (WPA) security on a Belkin Wireless Router or Belkin Access Point for a home network.

Solution:

1. From the “Security Mode” drop-down menu, select “WPA-PSK (no server)”.

2. For Encryption Technique, select “TKIP” or “AES”. This setting will have to be identical on the clients that you set up.

3. Enter your pre-shared key. This can be from 8 to 63 characters and can be letters, numbers, or symbols or spaces. This same key must be used on all of the clients that you set up. For example, your PSK might be something like: “Smith family network key”.

4. Click “Apply Changes” to finish. You must now set all clients to match these settings.

Problem:

I am having difficulty setting up Wi-Fi Protected Access (WPA) security on a Belkin Wireless Router or Belkin Access Point for a business.

Solution:

If your network uses a radius server to distribute keys to the clients, use this setting. This is typically used in a business environment.

1. From the “Security Mode” drop-down menu, select “WPA (with server)”

2. For Encryption Technique, select “TKIP” or “AES”. This setting will have to be identical on the clients that you set up.

3. Enter the IP address of the radius server into the “Radius Server” fields.

4. Enter the radius key into the “Radius Key” field

5. Enter the key interval. Key interval is how often the keys are distributed (in packets).

6. Click “Apply Changes” to finish. You must now set all clients to match these settings.

Problem:

I am having difficulty setting up Wi-Fi Protected Access (WPA) security on a wireless Belkin client card for a home network.

Solution:

Clients must use the same key that the Wireless Router or Access Point uses. For instance if the key is “Smith Family Network Key” in the Wireless Router or Access point, the clients must also use that same key.

Double-click the Signal Indicator icon to bring up the Wireless Network screen. The Advanced button will allow you to view and configure more options of your card.

The “Advanced” button will allow you to view and configure more options of the card.

Once the advanced button is clicked the Belkin Wireless LAN Utility will appear. This Utility will allow you to manage all the advanced features of the Belkin wireless card.

Under the “Wireless Network Properties” tab, select a network name from the “Available networks” list and click the “Properties” button

Under “Network Authentication” select “WPA-PSK (no server)

Type your WPA key in the “Network key” box

Important: WPA-PSK is a mixture of numbers and letters from A-Z and 0-9. For WPA-PSK you can enter 8 to 63 characters. This Network key needs to match the key you assign to your Wireless Router or Access Point.

Click “OK, then “Apply” to save the settings

Problem:

I am having difficulty setting up Wi-Fi Protected Access (WPA) security on a Belkin wireless client card for a business.

Solution:

Double-click the Signal Indicator icon to bring up the Wireless Network screen. The Advanced button will allow you to view and configure more options of your card.

The “Advanced” button will allow you to view and configure more options of the card.

Once the advanced button is clicked the Belkin Wireless LAN Utility will appear. This Utility will allow you to manage all the advanced features of the Belkin wireless card.

Under the “Wireless Network Properties” tab, select a network name from the “Available networks” list and click the “Properties” button

Under “Network Authentication” select WPA

In the “ Authentication” tab, select the settings that are indicated by your network administrator.

Click “OK, then “Apply” to save the settings

Problem:

I am having difficulty setting up Wi-Fi Protected Access (WPA) security on a non-Belkin client card for a home network.

Solution:

For non-Belkin WPA Wireless Desktop and Wireless Notebook Network Cards that are not equipped with WPA-enabled software, a file from Microsoft called “Windows XP Support Patch for Wireless Protected Access” is available for free download:

www.microsoft.com/downloads/details.aspx?FamilyID=009d8425-ce2b-47a4-abcc-2748dc9e91diplaylang=en

Note: The file that Microsoft has made available works only with Windows XP. Other operating systems are not supported at this time. You also need to ensure that the wireless card manufacturer supports WPA and that you have downloaded and installed the latest driver from their support site.

Supported Operating Systems:

- Windows XP Professional
- Windows XP Home Edition

Enabling WPA-PSK (no server)

1. Under Windows XP, click “Start > Control Panel > Network Connections”.
2. Right-click on “Wireless Networks” tab will display the following screen. Ensure the “Use Windows to configure my wireless network settings” check box is checked.
3. Under the Wireless Networks tab, click the “Configure” button, and you will see the following screen.
4. For a home or small business user, select “WPA-PSK” under “Network Administration”.

   Note: Select WPA (with radius server) if you are using this computer to connect to a corporate network that supports an authentication server such as a radius server, please consult your network administrator for further information.

5. Select “TKIP” or “AES” under “Date Encryption”. This setting will have to be identical to the Wireless Router or Access Point that you set up.
6. Type in your encryption key in the “Network Key” box.

   Important: Enter your Pre-Shared key. This can be from 8 to 63 characters and can be letters, numbers, or symbols. This same key must be used on all of the clients that you set up.
7. Click “OK” to apply settings.

Problem:

I can’t print from one of the computers on my network. What do I do?

Solution:

For the PC to be able to print to the networked printer (printer on the print server), the printer’s software and drivers must be installed on the PC. Every manufacturer ships its printer with a driver and, usually, printing software. Be sure that you have installed the printer drivers and software on each PC from which you plan to print. In some cases, while installing the drivers and software for your printer, you may be required to connect the PC directly to the printer in order to complete the installation. This varies according to manufacturer.

Problem:

I keep getting the error message, “Cannot find the Router” when running the Print Server Wizard. What do I do?

Solution:

If the Print Server Wizard is not able to find the Print Server in the Router, this means the computer does not have a valid connection to the Router. The most common causes of this issue are:

1. **Wired computers (those not connected wirelessly):** Check the cable between the computer and the Router. Make sure the light on the front of the Router that corresponds with the port on the back of the Router is lit. (If the computer is plugged into port 4, make sure the light for port 4 is lit).

2. **Both wired and wireless computers:** Make sure that the network card's TCP/IP settings are set to obtain an IP address automatically. See the Router's manual for tips on checking and changing your settings. If the IP address assigned to the computer's network card are different than the Router's settings, this will cause a problem.
3. **Wireless Computers:** Be sure that the wireless computer is connected to your network. Your network has a network name (also called SSID). The default name of the Belkin Router is "belkin54g". It may be possible that there are multiple wireless networks in your area. To confirm that you are connected to your own network, and not a neighboring one, use your wireless networking utility to scan for wireless networks. If more than one network is found, choose your network from the list and connect to it.
4. **Wireless Computers:** If you are using wireless security such as WEP encryption, WPA security, or MAC address filtering, make sure that your computer is configured for the correct security settings. If you are using MAC address filtering on the Router, make sure that the computer's MAC address is entered in the "Allow List".

What's the difference between 802.11b, 802.11g and 802.11a?

Currently there are three levels of wireless networking standards, which transmit data at very different maximum speeds. Each is based on the designation 802.11x, so named by the IEEE, the board that is responsible for certifying networking standards. The most common wireless networking standard, 802.11b, transmits information at 11Mbps; 802.11a and 802.11g work at 54Mbps. See the following chart for more detailed information.

Wireless Comparison

Wireless Technology	802.11b	802.11g	802.11a
Speed	11Mbps	54Mbps	54Mbps
Frequency	Common household devices such as cordless phones and microwave ovens. May interfere with the 2.4GHz unlicensed band	Common household devices such as cordless phones and microwave ovens. May interfere with the 2.4GHz unlicensed band	5GHz - uncrowded band
Compatibility	Compatible with 802.11g	Compatible with 802.11b	Incompatible with 802.11b or 802.11g
Range	Depends on interference - typically 50-300 ft. indoors	Depends on interference - typically 50–300 ft. indoors	Less interference - range is typically 50-100 feet
Adoption	Mature - widely adopted	Expected to continue to grow in popularity	Slow adoption for consumers - more popular in business
Price	Inexpensive	More expensive	Most expensive

Technical Support

You can find technical support information at **http://www.belkin.com/networking** or **www.belkin.com** through the tech support area. If you want to contact technical support by phone, please call:

US: **877-736-5771 or 310-898-1100 ext.2263**

Europe: **00 800 223 55 460**

Australia: **1800 666 040**

USB Print Server FAQs

Q: Does the print server work with Mac OS?

A: No. Printing is only supported for Windows 98SE, Me, 2000, and XP.

Q: What printers work with the Router's print server functionality?

A: For the latest printer compatibility list, check http://web.belkin.com/support/printserver/list.asp

Q: Does the Print Server support multifunction printers (i.e., those that fax, copy, and scan)?

A: While it may be possible to print to your multifunction printer using the Print Server, the scanning functions, as well as any other bidirectional functions, will not work.

Q: Will I still be able to get messages from the printer such as low paper, low toner, etc., when using the Print Server?

A: No. The print server is not bidirectional. Messages from the printer cannot be displayed on the PC.

Q: Why do I have to install the printer's drivers and software on my PC first?

A: For the PC to be able to print to the networked printer (printer on the print server), the printer's software and drivers must be installed on the PC. Every manufacturer ships its printer with a driver and, usually, printing software. Be sure that you have installed the printer drivers and software on each PC from which you plan to print. In some cases, while installing the drivers and software for your printer, you may be required to connect the PC directly to the printer in order to complete the installation. This varies according to manufacturer.

FCC Statement

DECLARATION OF CONFORMITY WITH FCC RULES FOR ELECTROMAGNETIC COMPATIBILITY

We, Belkin Corporation, of 501 West Walnut Street, Compton, CA 90220, declare under our sole responsibility that the product,

F5D7231-4P

to which this declaration relates,
complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution: Exposure to Radio Frequency Radiation.
The radiated output power of this device is far below the FCC radio frequency exposure limits. Nevertheless, the device shall be used in such manner that the potential for human contact during normal operation is minimized.

When connecting an external antenna to the device, the antenna shall be placed in such a manner to minimize the potential for human contact during normal operation. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

Federal Communications Commission Notice
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

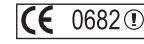
- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications
The FCC requires the user to be notified that any changes or modifications to this device that are not expressly approved by Belkin Corporation may void the users authority to operate the equipment.

Canada-Industry Canada (IC)
The wireless radio of this device complies with RSS 139 & RSS 210 Industry Canada. This Class B digital complies with Canadian ICES-003.

Cet appareil numérique de la classe B conforme á la norme NMB-003 du Canada.

Europe-European Union Notice
Radio products with the CE 0682 or CE alert marking comply with the R&TTE Directive (1995/5/EC) issued by the Commission of the European Community.



Compliance with this directive implies conformity to the following European Norms (in brackets are the equivalent international standards).

- EN 60950 (IEC60950) – Product Safety
- EN 300 328 Technical requirement for radio equipment
- ETS 300 826 General EMC requirements for radio equipment.

To determine the type of transmitter, check the identification label on your Belkin product.

Products with the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (72/23/EEC) issued by the Commission of the European Community. Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards).

- EN 55022 (CISPR 22) – Electromagnetic Interference
- EN 55024 (IEC61000-4-2,3,4,5,6,8,11) – Electromagnetic Immunity
- EN 61000-3-2 (IEC610000-3-2) – Power Line Harmonics
- EN 61000-3-3 (IEC610000) – Power Line Flicker
- EN 60950 (IEC60950) – Product Safety

Products that contain the radio transmitter are labeled with CE 0682 or CE alert marking and may also carry the CE logo.

Belkin Corporation Limited Lifetime Product Warranty

Belkin Corporation warrants this product against defects in materials and workmanship for its lifetime. If a defect is discovered, Belkin will, at its option, repair or replace the product at no charge provided it is returned during the warranty period, with transportation charges prepaid, to the authorized Belkin dealer from whom you purchased the product. Proof of purchase may be required.

This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication; if the product has been modified without the written permission of Belkin; or if any Belkin serial number has been removed or defaced.

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BELKIN®

High-Speed Mode Wireless G Router with Built-In USB Print Server

belkin.com

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